50TH ANNIVERSARY
OF
AMERICAN TELEVISION 1939-1989

THE OLD TIMER'S BULLETIN

OFFICIAL JOURNAL, ANTIQUE WIRELESS ASSOCIATION, INC.

Published for the Old Time Wireless Operator, Historian and Collector

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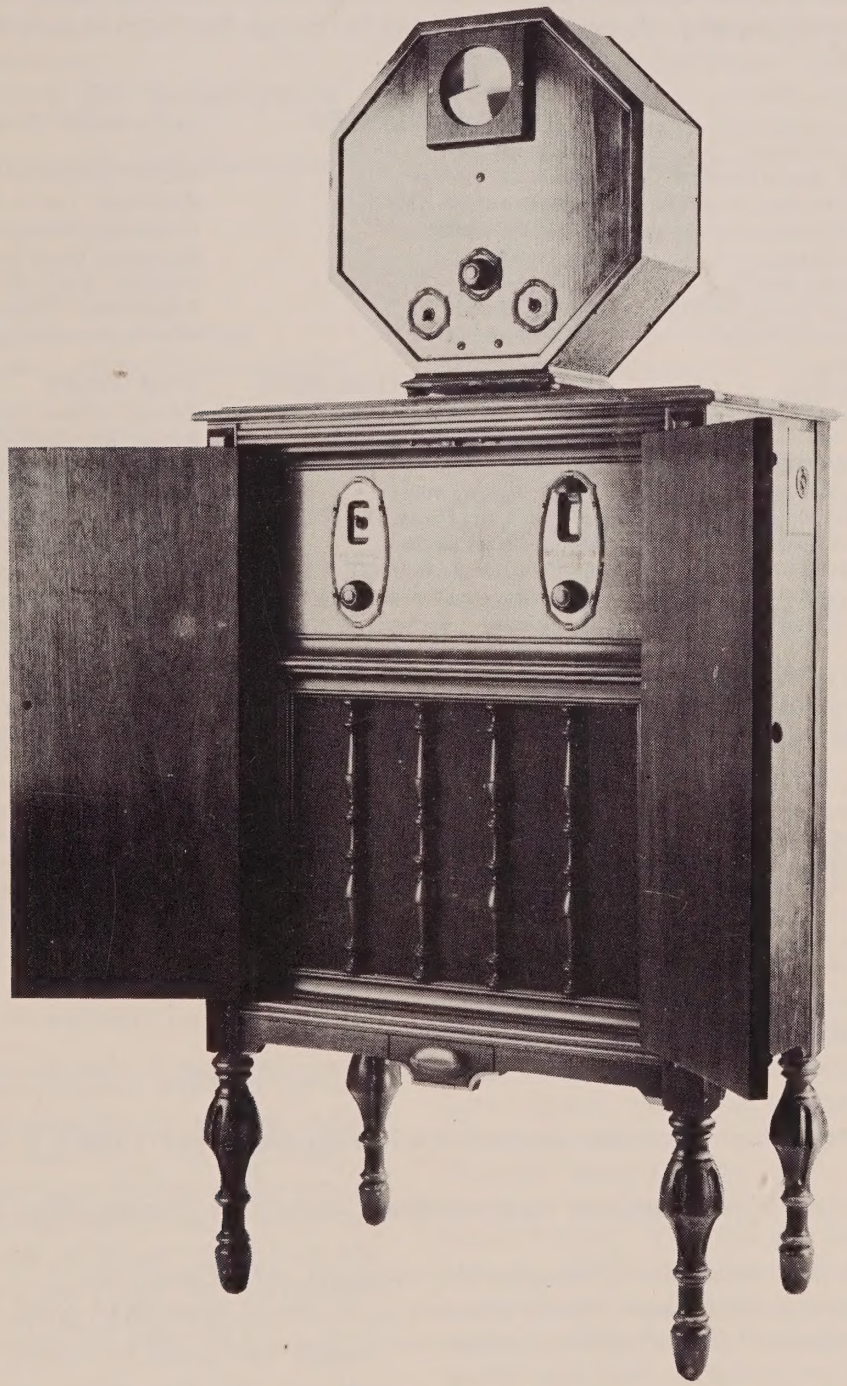

The General Electric Octagon Television Receiver, 1928

Devoted to research and documentation of the history of wireless communications.

Member:
American Association of Museums
Regional Conference of Historical Agencies

ANTIQUE WIRELESS ASSOCIATION, INC.

HOLCOMB, NEW YORK 14469

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The "Old Timers Bulletin": The AWA Journal

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Transistor Receivers: Norm Smith
Vac. Tubes: Bro. Pat Dowd, W2GK

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AWA DUES: mail check, payable to AWA, to Joyce Peckham, Box "E," Breesport, NY 14816. First Class mailing: 1 year, $10.00; 2 years, $20.00; overseas mailing (airmail): 1 year, $12.00

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MARCONI STATUE STOLEN, FOUND

On January 10, vandals removed a bronze bust of Marconi from a granite monument at the Cape Cod Marconi station site. It was done with some difficulty since it was necessary to pry the 18" statue loose from several metal rods.

Designed by a Massachusetts artist and donated to the U. S. government by several Italian industrialists, the monument was dedicated in 1974. It is at the one-time location of the famous South Wellfleet wireless station WCC, which sent the first transatlantic message (1903) from the United States: "Greetings from President Theodore Roosevelt to King Edward VII of England." The AWA Museum has several artifacts from the station including original transmitter drawings.

As we go to press, the statue has been recovered, having been returned and abandoned at the site in late March. It suffered only some scrapes from removal. Since the station site is under federal jurisdiction as part of the Cape Cod National Seashore, the theft was a felony carrying a maximum sentence of 10 years and a fine of $10,000. The National Park Service had offered a $2500 reward for information leading to the thieves' apprehension and return of the statue. AWA member Bud Hall, K2LP, lives nearby and kept us posted on events. [John Etter, W2ER]

-OTB-

FROM THE EDITORS

At this point, we have an interesting collection of articles and photographs for Volume IV of the AWA Review. As with past issues, our goal is to have the book available at Canandaigua.

The preliminary program for the annual conference at Canandaigua is in this issue; full details and advance registration material will be in the August OTB. At that point, we'll also be able to report on the trip to England and the joint meet with the BVWS.

Elsewhere in this issue, we give details on sending in proposed articles on a floppy disc. We're still happy to take good material on paper, but for you word-processor users, it certainly makes more sense to provide machine-readable input to flow directly into the computer. Copy should be keyed only once!

This OTB contains an interesting commentary on Lee de Forest by noted historian Kaye Weedon. Its view of the inventor is not in the conventional mold. We hope you find it interesting. We also have the results of the Old Time contest, another good hands-on article by Rodney Schrock, and a charming description of GE's experimental "octagon" disc TV set of 1928 and its use. The "AWA Profile" column covers a radio operator's experiences in the central Pacific in the lost days of the '30s when intercontinental travel by modern means was just beginning.

This is, of course, "museum season." The AWA display at Holcomb is open, and it is now possible to visit the Museum Annex nearby. See the rear cover for details.

AWA ACTIVITIES

HARRISBURG MEET SCORES

The meet at the Pennsylvania State Museum on March 31 and April 1 was a winner. Friday was occupied with extensive flea-market activity at a motel nearby and with informal tours of the museum's exhibition, "Making Waves: Radio Communication in Pennsylvania 1900-1935." Saturday morning involved more swapmeet activity, then an afternoon tour of the exhibits.

The display itself was most satisfying: wireless gear, a selection of tubes ranging from the precious Marconi Type D to the common 201A, early military equipment, a frequency multiplier from Armstrong's FM demonstration transmitter, crystal sets, broadcast radios, Harry Houck's original 1909 amateur station, a mockup of a Twenties broadcast studio, etc. Items on display were drawn heavily from the museum's resources as donated by Houck, supplemented by loans from Ralph Williams, Bob Paquette, and others. A subtheme of the exhibition was the contributions of Pennsylvania technologists like Elihu Thomson, Father Joseph Murgas, Atwater Kent, and Houck.

Best of all, the exhibition was professionally designed and placarded, Smithsonian-style, with suitably chosen photo prints to contribute to the overall theme. To pique the interest of the general public, there were hands-on displays ("You Can Be an Antenna") and recordings of snippets from old-time radio broadcasts. The overall design achieved the difficult objective of satisfying old-time radio people while appealing to a broader audience. (We must remember that there is a growing body of people who have never seen a vacuum tube.) James Mitchell, curator for the Industry and Technology section of the Museum, is to be congratulated for the quality of the job. The exhibition ran through the end of April, but the museum staff may be persuaded to continue a smaller radio exhibit.

Mel Comer deserves major credit for organizing the meet; it went well indeed. [LAS]

FLORIDA SPRING AWA MEET

The meet, held on March 18 at the Stewart Elementary School in Bradenton, ran until late afternoon. Besides locals and Georgians, we had attendees from as far away as Ohio, Pennsylvania, Minnesota, and New York.

The weather was perfect, so the flea market extended out into the parking lot. Everybody had a good time with a busy swapmeet, not to mention the free refreshments. We will be holding another meet in December at the same place, date to be announced. [Norm Smith]

AWA INTERNATIONAL REPRESENTATIVES

Australia - Ray Kelly
Austria - Franz Mock
Brazil - Carlos Fazano
Canada - Fred Hammond, VE3HC
England - Tony Constable
France - Guy Biraud
Germany - Rudy Walz
Israel - Joe Marsey, 4Z6JM
Japan - Taizo Arakawa, JA3AER/N2ATT
New Zealand - John Stokes
Norway - Kaye Weedon
Sweden - Bengt Svensson
Switzerland - Max deHenseler, HB9RS

NOTICE ON MEMBERSHIP DATES

Please notice that AWA dues dates as listed on your mailing label have been moved forward one month to match the current mailing dates of the Old Timer's Bulletin. All members still receive four issues of the Bulletin for a one-year membership fee. The change just brings our computer into agreement with our current mailing practices. [Joyce Peckham]

NEW AWA SHOW: "THE KEY"

The Association will soon have a new slide/tape show for use at club meetings. Titled "The Key," it will depict the development of landline telegraphy. The commentary is directed toward the lay person and will identify various types of keys and associated telegraph collectibles.

The script has been prepared by AWA key historian Lou Moreau, W3WRE. It will be an ideal program for either collector or amateur clubs. Running time is approximately 38 minutes. [BK]

(Continued on p. 5)

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1988 FALL BUSINESS MEETING AWA BOARD OF DIRECTORS

Lauren Peckham, President

The AWA Board held its annual Fall business meeting at Canandaigua on November 6, 1988.

Dick Ransley replaced Dick Fish as Second Vice President. Joyce Peckham, in turn, became both Secretary and Membership Secretary. Bill Fizette and Ludwell Sibley were elected to the Board.

Bruce Kelley reported on progress in establishing an office/library in the Museum Annex building at East Bloomfield. AWA is providing the American Legion with a new, separate prefabricated structure for their use, releasing the present Legion space in the Annex for remodeling (insulation, humidity control, etc.). The work was scheduled to start in mid-November.

Joyce Peckham covered membership: currently 3024 U. S. members, 118 in Canada, and 116 in other countries. The total is up 115 from last year.

Members of the Museum Committee described plans to improve the museum and its displays. Ed Gable intends to upgrade the exhibit of communication receivers. Roland St. Louis explained efforts under way to obtain improved samples of classic military and commercial equipment, which is becoming ever harder to find in unmodified condition. Chuck Bliley is in the process of taking inventory results from other members of the Committee and updating the inventory data base. Art Kelly reported that the Museum had been open 51 times during the 1988 season, with a number of special tours having visited. Steve Sykes has been appointed Assistant Curator.

Lauren Peckham discussed plans for the 1989 conference: at Canandaigua, on October 4-8.

The Board considered the pending request from Bill Fizette to proceed with a fourth issue of the AWA Review and approved it.

Dick Ransley has become the new coordinator for dates, slide shows, etc., for regional and joint-AWA collector meets.

Joyce Peckham explained the status of plans for a joint meeting with the British Vintage Wireless Society.

SILENT KEYS

Charles J. Hinkle, K4TS, 65. Pioneer AWA member and five-time winner of the AWA Old-Time Contest. Former chief engineer of radio stations, including WFVA in Fredericksburg, WV, and electronics engineer at the Naval Proving Ground at Dahlgren, WV. (Information by courtesy of Dave Ridderhof, K6SO.)

Eldon Heck, W8PO

Elizabeth Zandonini, W3CDQ

BULLETIN DEADLINES

Our production and printing process require a certain amount of lead time. If you plan to submit material for publication, please adhere to the following dates:

Issue:.	Feb.	May	Aug.	Nov.
Articles:	10-1	1-1	4-1	7-1
Meeting Notices:	12-1	3-1	6-1	9-1

Want Ads go to Dick Ransley, 17 Sheridan St., Auburn, NY 13021. **Meeting notices** go to Lauren Peckham, Ormiston Rd., Breesport, NY 14816. **All other material** goes to Bill Fizette, RD1, Box 55, Henryville, PA 18332.

For authors using word processors and submitting articles of a page or longer: we can print your contribution sooner and with less chance of error if you include a copy on disc. We can take 5-1/4 floppies in MS-DOS format, in ASCII form ("unformatted"), in either double-density (320K) or high-density (1.2 meg) form. We can take 3-1/4" discs as a second choice. If this terminology is unfamiliar, let us know; we can "talk you through it," and we have some flexibility as to format.

AWA NETS (EST)

Phone (SSB) -
Sunday: 7247 kHz at noon; 3867 kHz at 5 PM
Tuesday: 14274 kHz at 2:30 PM; 3837 kHz at 8 PM
Mon/Wed/Fri: 3837 kHz at 9:30 AM
CW (Morse) - 7050 kHz daily at 4 PM; first Wed. of each month at 8 PM (note change from 3584, due to present propagation conditions)

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COMING EVENTS

May 5-6 - IHRS/AWA, Ft. Wayne, IN
May 13 - AWA New Jersey, Tranquility
May 19-21 - ARRL Atlantic Conv., Rochester
May 19-20 - NARC/AWA, Bloomington MN
May 20 - SCARS, Hollywood-Burbank Airport, Burbank, CA
June 1-3 - ARCA National Conv., Mystic, CT
June 21-29 - BVWS/AWA Meet, London
August 10-12 - ARCI/AWA Radiofest '89, Elgin
August 19 - NFWA/AWA Summer Meet, Elma
September 8-10 - VRPS/AWA Conv., Dallas
October 4-7 - AWA Annual Conf., Canandaigua
November 5 - Annual AWA business meeting, 2:00 PM, Sheraton Inn, Canandaigua, NY

INDIANA MEET - IHRS/AWA

Friday & Saturday, **May 5-6**

Organized by the Indiana Historical Radio Society at the Ramada Inn, Ft. Wayne, IN

Friday
PM Early registration & seminars
7:00 "Old Tyme Movie"; AWA Show
Saturday
9:00 Registration in lobby; swapmeet in parking lot
9:30 Registration for Old Equipment Contest
10:00 Register auction items
10:30 Contest judging
1:00 Auction
4:00 More swapmeet
6:30 Social hour
7:30 Banquet, contest awards

For details, send SASE to John Foell, 7083 CR 11A, Auburn, IN 46706. For room reservations, contact the Ramada Inn, 1212 Magnavox Way, Ft. Wayne, IN 46804, phone 1-2RAMADA.

NORTHERN NEW JERSEY MEET

Saturday, **May 13**

"The Still," Tranquility, NJ, Sussex County Rte. 517, approximately 1.5 mi. north of exit 19 of I-80 (Allamuchy) (same as last year).

Dinner Friday evening; rooms available at the Panther Valley Motor Inn nearby for those wishing to stay over. Flea market and luncheon Saturday.

Dinner reservations must be made in advance. For details, send an SASE to John Richardt, W2WIY, 94 Bald Eagle, Hackettstown, NJ 07840, 201-852-3475.

MINNESOTA MEET - AWA/NARC

Friday-Saturday, **May 19-20**

Northland Antique Radio Club "Radio Daze '89," Hotel Seville, 8151 Bridge Rd., Bloomington (612-831-1300). Swapmeet, programs, contest, luncheon, visit to the Pavek Museum. Write (quickly) NARC, PO Box 18362, Minneapolis, MN 55418 or contact Jim Thompson, 612-822-4000.

ILLINOIS MEET - ARCI/AWA

Friday-Sunday, **August 10-12**

Antique Radio Club of Illinois RADIOFEST '89, at the Holiday Inn Holidome, 345 River Rd., Elgin, IL 60120 (reservations: 312-695-5000). Will feature a three-day flea market, special Zenith exhibit, tours of Ralph Muchow's museum, Friday evening awards banquet, a donation auction, and old-equipment contest. For information, contact Dan Gustafson, GSA Corp., 211 E. Ontario St., Chicago, IL 60611, 312-664-1999; or Jeff Aulik, 803 N. Chicago Ave., Rockford, IL 61107, 815-399-1902.

WESTERN NY MEET - NFWA/AWA

Saturday, **August 19**

Niagara Frontier Wireless Association, Elma Conservation Club, Elma, NY. The program:

10:00 AM Flea Market
12:30 PM Dinner
1:00 PM AWA program
2:00 PM Announcement of contest winners

Equipment contest: entries delivered 10:00-noon. Categories: Buffalo area radio (Wurlitzer, battery, AC - includes Aragon, Colonial, King, Larkin, USL); Federal radios (transmitting sets, broadcast sets, other - horns, literature, etc.); items purchased in England (crystal sets, tube radios, novelties/other). Dinner reservations required, by August 12, to Jim Kreuzer, 6270 Clinton St., Elma, NY 14059, 716-681-3186.

TEXAS MEET - VRPS/AWA

Friday-Sunday, **September 8-10**

Vintage Radio and Phonograph Society Convention '89, Holiday Inn - Dallas Southwest (same site as previous years). Will celebrate the 15th anniversary of VRPS with special activities. The equipment auction (567 lots last year) will be divided into two events; hence the extra day. Highlights: auctions, Friday and Saturday; old-equipment contest, Saturday; awards banquet,

(Continued on p. 8)

28TH AWA HISTORICAL RADIO CONFERENCE

Sponsored by the Antique Wireless Association, Inc.

October 4-7, Sheraton Inn, Canandaigua, New York

"In the heart of the beautiful Finger Lakes" (near Rochester)

4 DAYS OF OUTSTANDING ACTIVITIES for the RADIO COLLECTOR-HISTORIAN

- **3 large auctions plus the world's largest antique flea market**
- **programs for ladies, dinners and other attractions**
- **equipment contests, exhibits and seminars**
- **5-star program**

Bruce Kelley, Program Chairman

"1939-1989: 50 YEARS OF U. S. COMMERCIAL TELEVISION"

To commemorate this anniversary, we plan to afford members the opportunity to witness the earliest and latest in television receivers. Although not fully confirmed, we expect to have in operation a 1929 Nipkow scanning-disc set, a Philco Predicta with 1950s program, a CBS color wheel, and a demonstration of high-definition TV (HDTV). Current plans call for Dick Brewster to present a slide talk, "Television Development in the Thirties," covering the technical development of electronic cameras and receivers.

SPECIAL WORKSHOP FOR BROADCAST COLLECTORS

Mel Comer will conduct a special session for members interested in collecting broadcast receivers. Several well-known authorities will demonstrate how to refinish cabinets, troubleshoot ailing sets, and find replacement parts. Receiver specialists include Ron Frisbie, Doug Houston, Don Patterson, Todd Prowell, and Rodney Schrock.

KEY AND TELEGRAPH WORKSHOP

This is the only planned nationwide gathering of telegraph instrument collectors. Murray Willer, VE3FRX, will chair a group of well-known key collectors who will identify telegraph and radio keys as well as early telegraph instruments.

VACUUM-TUBE SEMINAR

The continuing interest in collecting and identifying old tubes makes this seminar a "must." Bro. Pat Dowd and Lauren Peckham will identify odd tubes brought in by members and estimate their value. A special feature will be a brief showing of Dowd's collection at Manhattan College in New York.

AMATEUR MEETING

A popular gathering each year is the Amateur Meet. Subjects include construction and operation of early amateur transmitters and receivers as well as results of the annual OT Contest and 1929 Transmitter QSO Party. Bring your homemade OT TX and RX for display.

THE NAA STORY

Most historians agree that the one-time NAA at Arlington, Virginia was our nation's greatest pioneer wireless station. The station has been thoroughly documented with rare photographs by John Nagle, K4KJ. Amateur and professional historians should not miss this presentation.

BOOK AND MAGAZINE WORKSHOP

Collecting early radio books and magazines is an old hobby that has not received enough attention. This will be a "first" for AWA. We will discuss what is collectible and some idea of value.

TESLA-COIL WORKSHOP

Repeated requests place this event high on the priority list. Authorities Jim Hardesty and John Wiesner will demonstrate the construction of Tesla coils. This will be a unique opportunity to learn how to build small coils for home demonstration.

WHAT'S IT LIKE TO BE A "SPARKS" IN THE MERCHANT MARINE TODAY?

AWA member Gene Black (W2LL) first went to sea as a merchant-marine operator in the 1930s, then came back forty years later for his

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"retirement career." His slide show will give us some insight into modern cargo ships and cargo handling, as well as shipboard electronics and the life of today's radio-electronics officer.

TELEVISION MUSEUM CURATOR AS GUEST OF HONOR

The Association is fortunate to have Richard Koszarski, curator of the American Museum of the Moving Image, as guest of honor. The AWA's journal has previously covered America's only museum devoted entirely to motion pictures and television (see February OTB, p. 11).

OTHER HIGHLIGHTS

The world's largest antique radio flea market, equipment contest, entertainment, three large auctions, two dinners, plus planned luncheon and a special program for the ladies!

-OTB-

REGISTRATION CARD AND PROGRAM IN AUGUST BULLETIN.
NOTE: ADVANCE REGISTRATION ADVISABLE.

AWA PUBLICATIONS

OTB BACK ISSUES

The following issues of the Old Timer's Bulletin remain in stock. Make a check out to AWA and mail to: Dexter Deeley, 8 Briar Circle, Rochester, NY 14618.

Volume and Number

14-4	21-2	23-3	25-4	27-3	29-2
17-1	22-1	23-4	26-1	27-4	29-3
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19-4	22-3	24-3	26-3	28-2	
20-2	22-4	24-4	26-4	28-3	
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19-3 20-1 20-4 (Issues with monograph)
$4.00 each postpaid

1-2 and 1-3 (Reprinted for reference)
$0.50 each postpaid

THE AWA REVIEW, VOL. III

Volume III of the AWA Review (1988) offers seven items of interest to collectors and those concerned with the history of electronics.

Pioneer broadcaster Bob Morris discusses early broadcast audio, while Alan Douglas reports on the development of AC-operated power supplies by two government employees in the '20s and how the resulting patent struggle threatened the developing radio industry. Ralph Williams' third major article on the Atwater Kent story covers 28 pages on the later models in the AK line. Lud Sibley covers the history of the national radio networks of the 1920s and their wireline technology. Lauren Peckham provides a complete rundown on the radio gear of Ernest Mignon, with superb pictures of "Mignon System" apparatus. Foreign and military telegraph keys are covered in detail by two authorities, Lou Moreau and Murray Willer, with 57 photos. Finally, Glen Fuller, a major expert on the Alexanderson alternator, gives the story of its mechanical development.

Vol. III (136 pages, 139 illustrations) is still available for $9.50 postpaid. See "Back Issues" above for ordering information.

Lauren Peckham is still surveying the level of interest in reprinting Vols. I and II, which went out of print rather quickly. If interested, let him know via the address on the masthead.

COMING EVENTS (Continued from p. 6)

Saturday night; inside swap session and flea market, Sunday. More details in the August OTB.

CANANDAIGUA MEET - AWA

Wednesday-Saturday, **October 4-7**

Sheraton Inn, Canandaigua, NY. Preliminary program follows in this issue; complete details in the August OTB. Mind-boggling event.

-OTB-

★ AUSTRALIAN RADIO MUSEUMS AND COLLECTORS ★

Don Nordenholt
1509 Cliffbrook Drive
Plano, TX 75075

My wife Michelle and I took a two-week vacation to Australia in February of 1988. While we were planning the trip, Bruce Kelley gave me the name and address of Ray Kelley, the president of the Historical Radio Society of Australia (HRSA). I wrote to Ray; he responded with recommendations on radio museums that we should see and invited us to attend the HRSA meeting scheduled for February 18. We took his advice and saw the Orpheus Museum, about an hour's drive outside Melbourne, and the Telecommunications Museum in Adelaide.

The Orpheus Museum is located in a corner of an electronics factory. Both belong to Mr. Richard Wilson, whose grandfather made radios under the Orpheus name in days gone by. The museum contains exhibits of old-time radios, victrolas, tape recorders, cameras, tubes, microphones, phonograph needle tins, and the like. I understood that some of the radios belong to a local radio station and the rest to Mr. Wilson. He assured us that nearly all the exhibits work, having restored them himself, and said he'd like to see more American antique-radio enthusiasts stop by. He is also looking for more phonograph needle tins. If anyone wishes to donate or swap, I can furnish his address.

The Telecommunications Museum contains three floors of exhibits. The first has some fine displays of telegraph apparatus and memorabilia on the construction of Australia's first land and undersea telegraph lines in the 1800s. The second floor is devoted to telephony, with exhibits of telephone sets, switches, carrier equipment, microwave radio, and teletypewriters.

The third floor is radio collector's heaven! It contains more radios, from crystal to transistor sets, than I have ever seen in one place. It also contains millions of tubes, several phonographs, and a reproduction of a Thirties radio studio. The official line is that all the materials were donated and that Telecom Australia provides only space. However, considering the quantity and quality of the displays, the incredible amount of restoration that must have been required, and the fact that they don't charge admission, I suspect that somebody is subsidizing the place. One person I met confided that he believed that much restoration was done in Telecom Australia's workshops. I would not be surprised.

On the 18th, I attended the HRSA meeting in a suburb of Melbourne and met Ray Kelley and many other HRSA members. (Michelle stayed at the motel. I guess that after the two museums, she was pretty tired of old radios.) Anyway, before the meeting was called to order they had a swap meet where some interesting radios and radio literature changed hands. After club business was discussed, I was presented with an HRSA pin, and was asked to say a few words about the AWA, the VRPS, and radio collecting in the States. After the meeting was closed, we had our tea and dessert and chatted about a variety of subjects. Ray and I made plans to see his collection and that of Phil Renouf the next day.

The following afternoon, Michelle and I went to Ray's house and admired his collection, which consists mostly of horn speakers and radio sets from the Twenties and Thirties. He also had some interesting tubes, portables, books, posters, etc. I was particularly impressed by his Loewe set which was complete with the original tube. Incredibly, someone just gave it to him, knowing he was interested in old radios. We should all be so lucky! I signed a membership application and Ray gave me a couple of tubes, some poster reproductions from old-time advertisements, and enough back issues of the HRSA bulletin to occupy me on the 24-hour flight home. After a ride up and down the mountains and treating us to dinner, Ray took us to Phil's house.

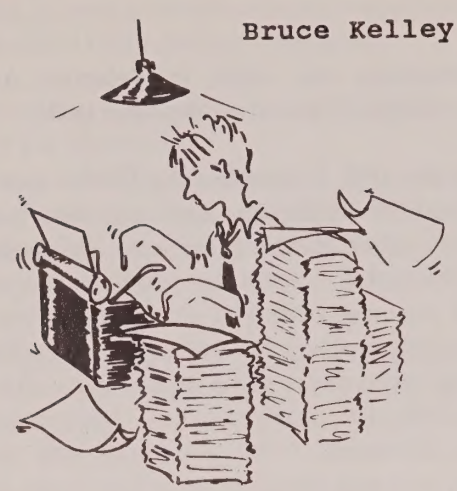
Phil reckons he has something like 200 radios in his home. They are in every room; it is hard to turn around without bumping into a dozen or so. They even occupy the space in his garage that is not taken up by the two vintage Morris Minors! They appear to be mostly more recent sets than Ray's, from the mid-Thirties on up, not many crystals or TRFs. I had intended to ask if he had one he would be willing to sell, but before I had the chance he offered one for free! I chose a Philips in a cream-colored plastic cabinet. I estimate it is from the late Fifties. I also bought from him an HMV (His Master's Voice) of similar vintage with a brown plastic cabinet and cream-colored speaker grille.

It was surprising how rich Australia is in radio history. For a relatively small country, they had a

(Continued on p. 46)

IN-HOUSE

Bruce Kelley



THUNDER ON WHEELS: The third annual "Thunder on Wheels" meeting was held recently in New Orleans. This is a gathering of mobile-audio equipment manufacturers and distributors to show their latest auto installations and make a lot of noise. A highlight was a contest for the most powerful car stereo. A contest rule limits the audio level to 140 dB unless the contestant is out of his vehicle during loudness measurement. In this situation, a remote volume control is used. Forty percent of the cars scored over 140 dB, with the loudest at 151 dB with 1000 watts of audio! (For reference: the threshold of pain is about 130 dB; a four-engine propeller aircraft at full power produces about 150 dB close by.) On this same subject, some of the more powerful speakers have air vents to cool the voice coils . . .

WORLD'S DX RECORD: Here's a record no one (?) can beat. Voyager II will sail past planet Neptune in August. If all goes well, the 230 foot dish antenna at the Goldstone Space Station will receive signals from the Voyager's 22-watt transmitter, 2.8 billion miles away. Translated, it means the receiver will be picking up signals of only 12 attowatts: 12 millionths of a millionth of a millionth of a watt in strength! (That's about -139.2 dBm to you telephone people.) The feat will require alignment accuracy of less than 1/8" in the surface of the huge dish.

COL. CLAIR FOSTER: Floyd Paul's article on Frank C. Jones in the November '87 OTB (p. 34) reviewed the Thirties magazine "Radio" but did not mention the magazine's editorial policy. For several years the magazine carried a series of editorials written by Col. Foster (W6HM). This guy was strictly anti-ARRL. His target was Editor and Business Manager K. B. Warner. His diatribe never touched tech editors Lamb or Grammer. Foster's acid tongue predicted ARRL's downfall, but alas, ARRL is still going strong: I recently donated a small sum to W1AW's Building Fund. It was too bad such a fine technical magazine had such a lousy editorial policy - but then, maybe it attracted subscribers. Some people like off-beat copy. I was too busy chasing DX and girls in '35 so I didn't care. The critical editorials tapered off after Foster's death, October 2, 1935.

CODE EXAMS: I am sure many of you have read editorials/letters to editors advocating elimination of code for an amateur license. Here's a new twist: one letter writer strongly feels the FCC should keep the code requirement but **eliminate the theory**! His argument is that 95% of all amateurs use factory-made equipment and wouldn't dare to touch it if something were wrong for fear it would void the warranty - so why is there a need for technical know-how? He has a point: how many of you would tear into your Kenwood transceiver - let factory-trained technicians do it. See the February cover of "Ham Radio" magazine (showing a disconsolate radio owner staring at a small transceiver on the workbench, with an incredibly complex schematic diagram covering a square yard or so) and you'll know what I am talking about . . .

MILLION-DOLLAR DJ: Like some others, I seldom listen to current pop music so was quite surprised to learn that two disc jockeys are in the million-dollar salary bracket. Shadoe Stevens is paid one million dollars for spinning the top 40 discs over ABC's 475 stations. Can you remember the Lucky Strike Hit Parade? [-BK]

Assistant AWA Museum curator Steve Sykes and Morgan Wesson during a visit to the new $8 million wing of the International Museum of Photography in Rochester. AWA has provided the Museum with several historical television items for display.

-OTB-

KENNETH LUM-KING, EX-K6BAZ

The mid-1930s were marked by a burgeoning technology in transportation and communication in spite of the hardships of the Great Depression. Those of us who lived in those awakening days can recall the thrill of reading about the pioneer flights of the magnificent Boeing China Clipper flying boats across the vastness of the Pacific, hopping from one isolated island to another, and the tragedy of the Amelia Earhart flight in 1937, when she disappeared on the way to Howland Island.

As a part of this opening-up of the Pacific, the U.S. Department of the Interior established radio stations on Jarvis, Baker and Howland Islands, the latter two 36 miles apart and lying a thousand miles west of Jarvis. All are close to the equator.

A letter from Mr. Lum-King inquiring about a mid-1930s receiver prompted my curiosity, since the name seemed familiar. Sure enough, an article in the November 1938 issue of "Radio," titled "Pounding Brass for Uncle Sam in the Mid-Pacific," and follow-up correspondence brought forth the story.

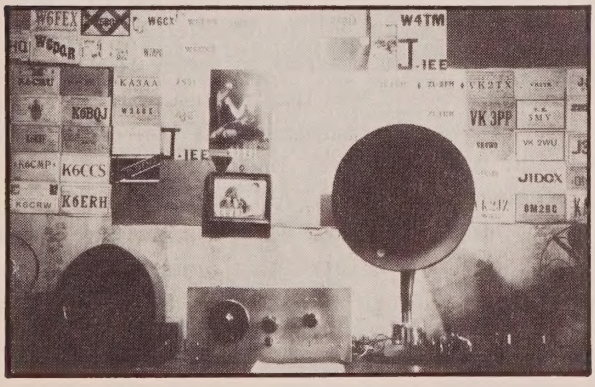
As a lad, Kenny had been licensed in 1930 as K6BAZ in his native Honolulu. He was hired by Pan American Airways as a radio operator on the two-masted schooner Kinkajoo. In 1935 he took part in the Coman Oceanographic Expedition. He was stationed for four months on Howland Island as K6XJI/K6BAZ. His job was to set up a radio station and make a rough sketch of the island to indicate possible canoe landing sites under various weather and tide conditions. The schooner would lie a mile offshore and the party would row ashore in canoes, a sometimes dangerous transit. The rig at the time was a 210 in a TPTG circuit with a National SW-3 receiver. He reports that it "worked fine."

Howland was a desert island and living conditions - tents and wooden shacks - were primitive. In 1937 another opportunity at the radio-op job arose, and with the depression in Honolulu at its trough, the $90 per month was big money. Kenny had had enough of isolated desert islands, but as he says, ". . . no jobs were to be had and my mother would take no excuses, so that was it.

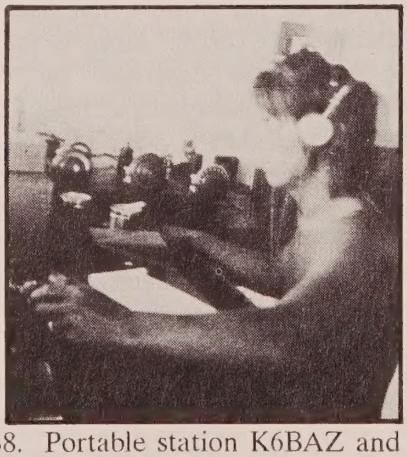
1935. First Howland Island camp. Portable station K6BAZ.

Living on an island 3/4 of a mile wide and 1-1/2 miles long, smack on the equator, with the highest elevation 12 feet, and no trees, no natives (YLs), only billions of birds above water and millions of sharks in the water, cannot be much fun."

The supply ship returned with provisions five months after dropping the party off. Kenny

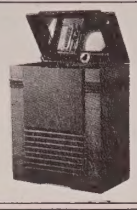


1930. Amateur radio station K6BAZ, Honolulu, Territory of Hawaii.

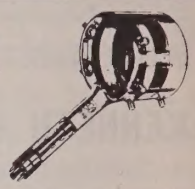


1937-38. Portable station K6BAZ and operator Kenneth Lum-King on Howland Island.

(Continued on p. 15)



THE TELEVISION RECEIVER



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THE GENERAL ELECTRIC OCTAGON RECEIVER

Jack Davis

Now that the General Electric Company has purchased RCA, which it helped found in 1919, it is interesting to review some of its activities in the early years of television.

The achievements of RCA had the benefit of David Sarnoff's promotional expertise, while GE's work, done mostly in the small upstate city of Schenectady, has largely been overlooked. Gener-al Electric did contribute greatly to the progress made in the earlier years, largely through the efforts of Dr. Ernst F. W. Alexanderson, who started with the company as assistant to Charles Steinmetz in 1901. During his 45-year tenure, his many accomplishments included the Alexanderson alternator that opened the way to reliable transoceanic communication.

In 1924, Alexanderson became interested in television and directed the research efforts of GE's laboratories in this area. What followed were a string of "firsts," largely unpublicized, that established GE in the forefront of those responsible for bringing television to reality. Among these were the construction and operation of W2XB, sister station to WGY. Now known as WRGB, it has been on the air since January 13, 1928.

Among this station's achievements was the broadcasting of the world's first television play on September 11, 1928. Here is the way that historic event was described by William J. Toneski in Hugo Gernsback's "Television News": "'Ready . . . Go ahead,' after a brief pause the microphone switch was press-ed and a voice announced the be-ginning of the world's premier television drama, which was broadcast from the studio of the General Electric Company's station at Schenectady, New York."

"When the curtain rose in this first theater of the air the audience 'saw' as well as 'heard' the key turning in the lock and the door opening in the initial scene of a play entitled 'The Queen's Messenger,' which had been written some thirty years ago by J. Hartley Manners."

"As the play went on, the heads of the two characters appeared in the pink field behind the four-inch lens of the television receiver, while their voices issued from the loud speaker below. When the action became more intense, the faces were 'faded out' and pantomime was again introduced; sometimes there was a cigar in the man's hand and a cigarette in the lady's; then again the hands picked up champagne glasses, filled them, and after the wine glasses tinkled lightly when touched, they disappeared only to reappear suddenly at the lips of the two actors."

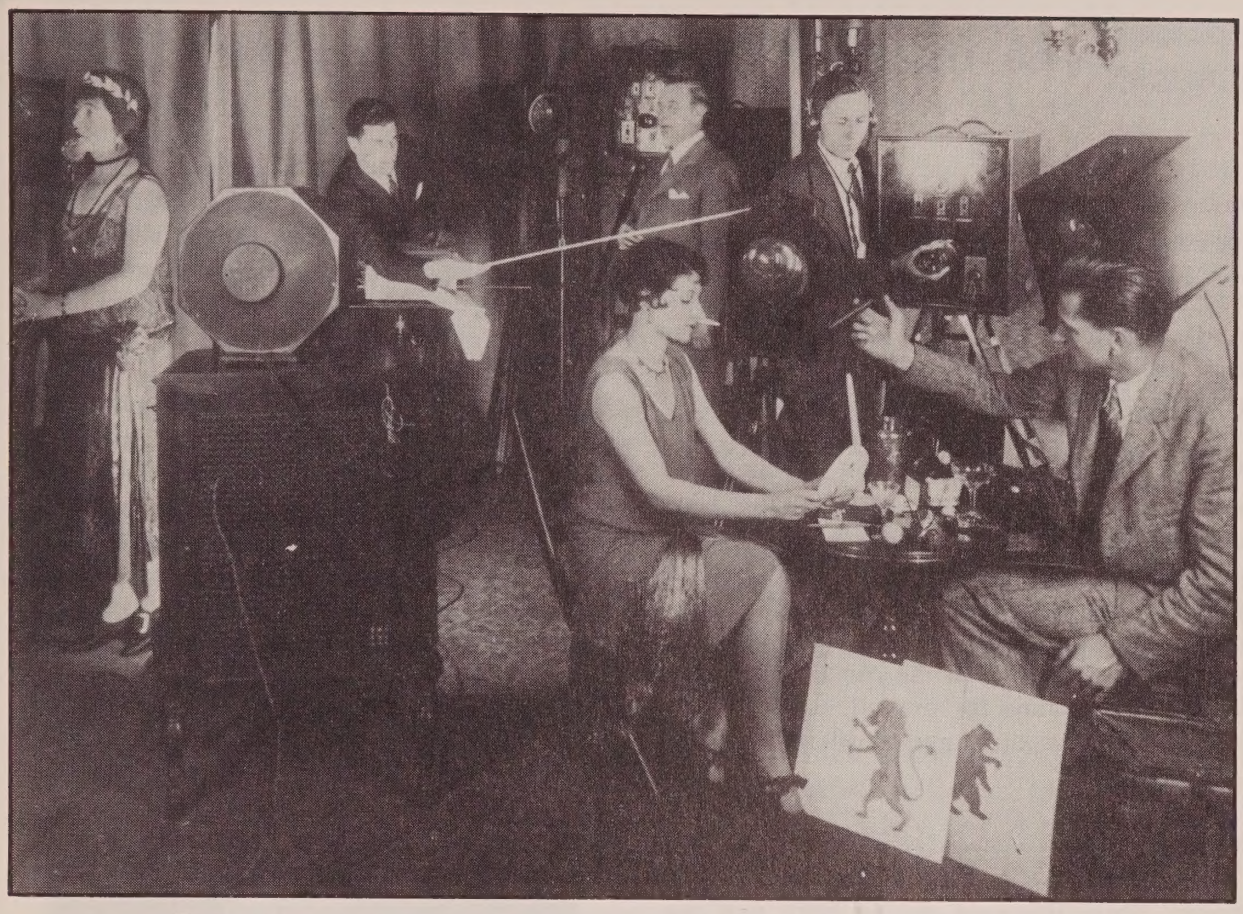
The accompanying picture, furnished by WRGB, has appeared frequently in articles dealing with early television. It shows the broadcast as it took place. In the lower left corner is a televisor acting as a monitor. These sets, designed by GE, were distributed to area residents for viewing the picture. Only a small number of these receivers, known as "Octagons," were manufactured. A few still exist, mostly in museums. One of them is on view at the Museum of the Moving Image (see the February OTB). This is a landmark receiver, as it is the first to have been manufactured by an established company.

The set is a modified Radiola 51, a console version of the well-known Radiola 18. Because the video signal was transmitted on 37.8 meters, the tuner was altered to cover the shortwave band. (Sound was transmitted in the AM band and received separately on a conventional set.) The original power pack and amplifier were replaced with an AP736 amplifier that had RC coupling to achieve wider bandwidth, an extra audio stage for additional gain, and phase reversal. Though the set was a Radiola, it was manufactured by GE, as were all of the other RCA sets of that era.

The televisor, which accompanied the receiver, resembled the RCA 103 loudspeaker. It sat atop

(Continued on p. 13)

(Continued from p. 12)



First televised play, 1928. Octagon set as monitor. Photo, courtesy WRGB.

the console. Two cables, fed from sockets on opposite sides of the receiver console, provided AC power to a motor-driven 48-line Nipkow disc and sent video to a Raytheon Kinelamp. A four-inch magnifier enlarged the picture from its actual size of about one inch. Two toggle switches and a knob that rotated a phonic wheel assembly were used for framing and synchronization. The televisor was made to match the receiver esthetically. It had a wood-grain finish, similar to the console's, while the escutcheons behind the switches and knob were coordinated with those on the receiver.

Alexanderson had hoped to mass-produce the scanners to sell for $100 but the poor quality of the picture failed to produce a consumer market. This field was left to firms like Jenkins, Western Television, ICA, and Baird until the mechanical era came to an end in 1932. As far as I know, this was the only video receiver that GE made prior to their 1939 introduction of electronic sets.

Nevertheless, with this historic 1928 broadcast, GE had opened the door to the unlimited entertainment and educational potential of television. Dr. Isaac Shoenberg, a major force behind the development of British television, put it another way when he addressed his colleagues: "Well, gentlemen, you have now invented the greatest time waster of all time. Use it well . . . We are lighting a candle . . . which will not be put out."

And now we have come full circle. GE and RCA, divorced in 1930, are together again, sharing their heritages, while all of us hope that the candle that they lit in America will continue to burn here and not migrate to other lands.

FURTHER NOTES ON WRGB

W2XB, later designated WRGB to honor pioneering radio engineer W. R. G. Baker of GE, began test transmissions on January 13, 1928. The initial program, two hours long, featured a GE executive taking off his glasses and smoking a cigarette, a radio announcer strumming a ukelele (this was the Twenties, after all) and singing "Ain't She Sweet," and an appearance by David Sarnoff, then a vice president of RCA. The broadcast was received on televisors in the homes of E. F. W. Alexanderson and two GE managers, nowhere else.

Regular programming began in May of 1928 with farm and weather reports three afternoons each week. W2XB performed what was apparently the first live remote telecast in August of 1928. It carried Governor Alfred E. Smith accepting the

(Continued on p. 46)

LEE DE FOREST'S "CRUST OF BREAD"

KAYE WEEDON

In his autobiography, Lee de Forest devoted Chapter 31, headed "The Telephone Company Gets a Bargain," to the events of the summers of 1913 and 1914: the sales of the rights to his "Audion" patents to the American Telephone and Telegraph Company (or, rather, its subsidiary, the Western Electric Company).

Western Electric in 1913 bought "the exclusive rights to the use of the Audion for wire telephone and wire telegraph purposes." Then, on August 7, 1914, de Forest was paid $90,000 for "a non-exclusive license in the field of wireless telegraphy." On March 16, 1917, AT&T bought, for $250,000, "all the remaining rights," de Forest "retaining for himself, under all his patents, a personal, non-transferable, non-assignable right."

When he received a check for $50,000 in 1913, de Forest was in dire need of money and had no choice. Only afterward did he learn that the purchaser, the North American Wireless Telegraph Company, of Maine, was actually a front for AT&T. Later, de Forest claimed to have "learned, on reliable but unofficial authority, that the directors of AT&T had voted to pay as high as $500,000 for the wire rights under the Audion patents."

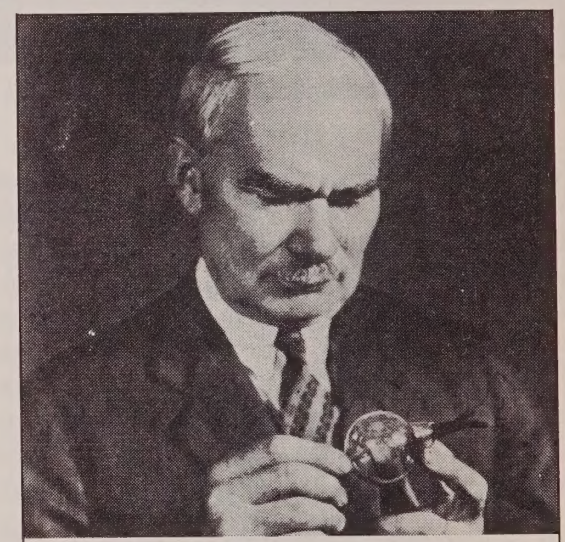
This is one of de Forest's myths. Hugh G. J. Aitken quotes a reported statement by an outside attorney of AT&T to the effect that the de Forest patent rights were bought "for about half of what we were prepared to pay."[1] Thus, if de Forest had been in a stronger bargaining position, he **might** have got a first payment of $100,000. De Forest was not satisfied; he called the $50,000 check "however small . . . a morsel of food for a starving man."

Evidently, in 1950, the self-styled "Father of Radio," whose personal character can be described leniently as many-faceted, was building up another myth.

It is interesting to take a closer look at this fable of hardship and apparent high-handed treatment of the poor inventor. Fifty thousand dollars in 1913 would approximately pay the annual wages of 77 skilled workmen, or of 38 employees in white-collar jobs.

We may apply another yardstick, not much favored by economists today: gold. (These lines were written for people who, like the author, never had much precious metal.) During all the long period from 1870 to 1917, gold was worth $20.65 per troy ounce (or, 31.10 grams). While these notes were being prepared in 1988, the fluctuating present-day price of gold twice passed $460 per troy ounce, giving a ratio of 22.276 times the 1913 value.

The accompanying table shows the gold weights and the 1988 dollars involved. Let us concentrate on just the 166 lbs. which de Forest could have received in 1913: the pure-gold value of $50,000. To carry this gold in attache cases without discomfort, it would hardly have been possible to put more than eight pounds of gold in each. A procession of some 21 men would be required to move it.



Dr. Lee De Forest, 1873-1961

(Continued on p. 15)

Year	Weight Kilogr.	Weight Lbs.(Av.)	Dollars Then	Dollars Now
1913	75.31	166	50,000	1,113,800
1914	135.56	299	90,000	2,004,840
1917	376.56	830	250,000	5,569,000
	587.43	1,295	390,000	8,687,640

De Forest (Continued from p. 14)

For the equivalent of a million-plus 1988 dollars, AT&T did not, in 1913, get a finished, technically useful or marketable invention. The "Audion" was in fact quite useless for its intended purpose of amplifying telephone signals. It was only after extensive research and development that the "Audion" became a "modern" high-vacuum tube.

After April 22, 1913, AT&T was able to produce highly evacuated tubes; there remained the considerable task of developing Wehnelt oxide cathodes which would perform satisfactorily in a high vacuum. By the summer of 1914 the new triodes were in trial operation in the repeaters of the New York-San Francisco telephone line. In 1917 these descendants of the "Audion" had been thoroughly proved in practical operation.

One might say that invention, like crime, does not pay; but, as in lotteries and gambling, the winners fascinate. The lucky few stand out against the dark background of the many losers. Two winners were Alexander Graham Bell and Michael Pupin. The first invented the telephone; the second devised the inductively loaded line for long-distance telephony.

Over and above the fortune Bell received from the Bell Telephone Company, he was awarded the Volta prize of 10,000 gold francs, with which he established the Volta Laboratory where important advances were made in phonographs.

By the narrow margin of two weeks, Michael Pupin in 1899 came in ahead of George Campbell of AT&T, and sold his patent to AT&T for $200,000 in 1900. By 1917, when the patent expired, the inventor had received $455,000 in royalties. In his famous autobiography From Immigrant to Inventor, Pupin says that he was "treated generously" and that he "got what he asked for."

It seems impossible to feel sorry for de Forest, the ungrateful great inventor: he had received money equivalent to somewhere between five and ten times his own weight in gold.

There are no pockets in the shroud: Lee de Forest died in June 1961. When his will was read, the estate was left to his wife, including $1,250 in cash, of which three daughters got $1 each.

The writer is indebted to Hugh G. J. Aitken, Alan Douglas, D. P. C. Thackeray and Keith Thrower for helpful advice and comments. A detailed bibliography is available upon application. Author's address: Gamle Drammensvei 135, N-1310 Blommenholm, Norway.

[1] H. G. J. Aitken, The Continuous Wave: Technology and American Radio, 1900-1932 (Princeton, NJ: Princeton University Press, 1985), p. 246.

-OTB-

Profiles (Continued from p. 11)

found there was no replacement operator, so he endured another five months on Howland. He noted that it seemed like five years, but Honolulu was 1700 miles away so he couldn't swim home, and anyhow, there were too many sharks.

The station during this second tour consisted of the old reliable SW-3 receiver, with the transmitter a 47-801 driving a 211 amplifier, modulated by a single 42. Power was by batteries and a gasoline generator, but with only a limited supply of fuel. The story is told in more detail in the "Radio" article, and makes for interesting reading. Incidently, if you wish to see a more up-to-date picture of ex-K6BAZ, look on page 81 of QST for January 1982.

-OTB-

1937-38. Colonists at end of 10 months' duty with mail from home - K6BAZ third from left.

RESTORING OLD EQUIPMENT

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REPLACING CABINET DECALS

First and foremost, never remove or destroy a decal on a radio cabinet unless it is absolutely necessary. A decal, even faded or slightly damaged, gives the receiver a certain authenticity. If there is a definite need to restore the cabinet finish, work carefully around the decal, blending the new finish into the decal outline. Straight-edged decals can be masked easily - just be careful not to use a sticky tape that will harm the decal.

If all else fails, new decals can be purchased from two sources. Antique Electronic Supply (688 W. First St., Tempe, AZ 85281, 602-894-9503) offers Atwater Kent, BBC, Emerson, Philco, RCA Victor, Stewart-Warner, and Zenith items, most of them in two sizes. Tudor Rees (Tudor House, Cossham St., Mangotsfield, Bristol BS17 3EN, England) can provide overseas members with BBC, Emerson, Ferranti, Gecophone, Philco, RCA Victor, and Zenith decals.

SERVICE LITERATURE FROM RIDER AND SAMS

In the old days, every properly equipped radio shop had a multi-binder set of Rider's "Perpetual Trouble Shooter's Manual." This source gave the radio servicer schematic and technical detail for most broadcast receivers. Rider published a comparable series of binders on television receivers after WW II, plus specialized auto-radio and public-address volumes.

Postwar years saw severe competition from another publisher, Howard S. Sams, in a folder-based format giving much fuller detail, at the cost of greater bulk. Rider fought back, unsuccessfully, with a "Tek-File" series on TV sets; his "perpetual" binder series ended in 1952. Prewar Rider's binders are still reasonably available on the collector market, while the later volumes are rather scarce. Sams folders turn up routinely, but rarely in organized sets. Sams folders after about 1948, of course, are predominantly television material. Fortunately, individuals offering to copy individual schematics from their libraries advertise widely in the collector press; also, a few public libraries (e. g., New Haven) still maintain sets. Printed below is a quick reference to Rider and early Sams material as provided by Clyde Watson of AARC. This list is useful for dating radios even if one has only an index, not the Rider binder or Sams folder itself: locating the set in the index at least gives an idea of when the receiver was intro-duced.

These two publications, while comprehensive, are hardly the only available sources of repair information on old-time sets. The Hugo Gernsback Official Radio Service Manual of 1930 and the Supreme Publications Most-Often-Needed 1926-1938 Radio Diagrams are both available in reprint and give rather good coverage of receivers of their respective time periods.

RIDER

Vol.	Sets Introduced
I	1919-1931
II	March 1931-June 1932
III	June 1932-June 1933
IV	June 1933-March 1934
V	Mid-1934
VI	Late 1934-early 1936
VII	Early 1936-November 1937
VIII	November 1937-1938
IX	1938-1939
X	1939 (television too)
XI	August 1939-June 1940
XII	June 1940-April 1941
XIII	April 1941-Early 1942
XIV	1942
XV	1946
XVI	Late 1946-1947
XVII	1947
XVIII	Nov. 1947-Nov. 1948
XIX	Late 1948-March 1949
XX	March 1949-Nov. 1949
XXI	Dec. 1949-Oct. 1950
XXII	Nov. 1950-August 1951
XXIII	September 1951-1952

SAMS PHOTOFACT SERVICE MANUALS

Each volume contains ten folders with about a dozen radio and TV sets each. Volume 1 contains folders 1-10; volume 2 contains folders

(Continued on p. 45)

TELECOMMUNICATION

EDITED BY
DON DeNEUF
WA1SPM

MARCONI PROVES HE DID IT

Much skepticism prevailed in 1901 when the news was received that wireless signals had crossed the Atlantic, says Stan Crabtree in his story "Proof of Poldhu" appearing in the "Ocean Voice." There was some cause for doubt, since the scientists' hierarchy was in a turmoil, especially about the wavelength Marconi used or thought he used - some thought he probably was hearing a harmonic of something - but all equipment in those early days was so broadly tuned that nobody knew for sure.

Conscious that his 1901 telecommunications accomplishment could not be readily substantiated, Marconi searched for a means of doing so. In 1902 the owners of the America Steamship Line agreed to cooperate with him on another experiment, aboard the SS Philadelphia. The ship's main mast was fitted with an extension to permit the rigging of a four-wire cage aerial above the vessel. Marconi installed a receiver using a coherer and paper-tape register to record signals. His plan was, when signals were recorded, to have the time and ship's position inscribed on the tape by the ship's master.

Good signals were recorded from Poldhu for the first two days of the voyage from England to New York. By the fourth day the signals were indecipherable during the day, but were satisfactorily received when darkness prevailed. As the distance increased, reception of messages bacame much more difficult, but Marconi had instructed the Poldhu operators to transmit a string of letter "S" signals between messages. At longitude 47.27 W, some 3358 km (2070 miles) from Poldhu, Marconi marked his fifth and final tape - which clearly recorded a string of "S" signals. It was endorsed by both the ship's master and the chief officer, with the time and position inscribed. At this point, the distance from Poldhu was approximately the same as that during the reception in Newfoundland the year before.

Marconi's aspiration to see wireless telegraphy as an effective means for communication with vessels at sea and between continents was moved another step forward. [D. K. deNeuf]

HDTV DEMONSTRATION

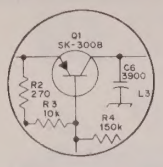
[The following is a follow-up on the "Status of HDTV" item in the February OTB.]

Eight AWA members from the Rochester area had an opportunity recently to view a demonstration of high-definition television (HDTV) at the Eastman International Museum of Photography, arranged by the local chapter of the Society of Motion Picture and Television Engineers. It was most interesting. As might be expected, reaction to the 1125-line/60-frame picture was mixed.

It was found necessary to be less than two feet from the face of the picture tube to see the lines comprising the scanned picture. At a distance of six feet the picture was perfect. The difference between 525- and 1125-line pictures was obvious but most observers agreed they normally watch TV at a distance where they do not see the lines. The high- definition picture seemed a little more pleasant to view and appeared more realistic.

A noticeable improvement was the screen shape. Screens of present-day TV sets appear almost square (aspect ratio of four by three), whereas the HDTV display (aspect ratio 16 by 9) was more rectangular and pleasing to the eye. We were reminded that 525-line TV does not show the full width of the 35-mm motion picture frame whereas HDTV does. Reaction of our observers: a vast improvement but they'll not rush to change to new sets. HDTV sets when available in the mid-90s are expected to cost in the $3000 range.

-OTB-



TRANSISTOR RECEIVERS

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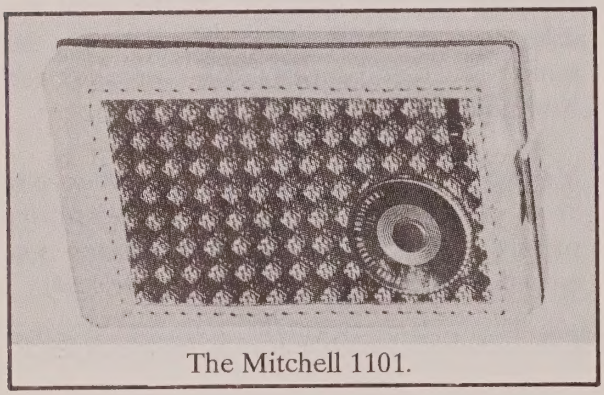
THE MITCHELL 1101 AND BULOVA 250

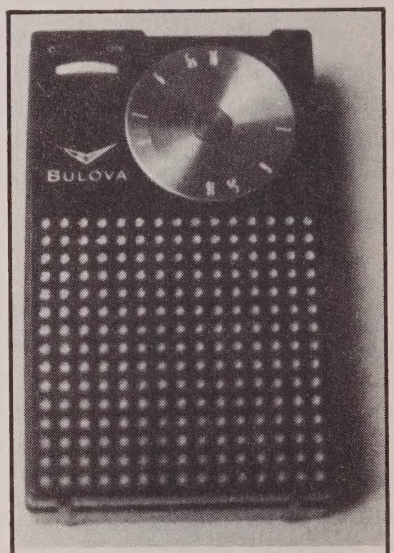
In October of 1954, the Regency Division of Industrial Development Engineering Associates (I. D. E. A.) in Indianapolis introduced for sale the first transistor portable radio, the TR-1. The story of the TR-1 was documented nicely in "The Secret Six-Month Project" in the December 1985 issue of the IEEE Spectrum.

Not so widely known: Regency made the same radio for two other companies. It was produced for the Mitchell Manufacturing Company and marketed as Models 1101, 1102, and 1103. The case looked much different; the radio was turned on its side, making it a horizontal design. This limited performance because the loopstick antenna was held vertically, cross-polarized with respect to broadcast signals! The earphone jack found on the TR-1 was omitted.



The Mitchell 1101.

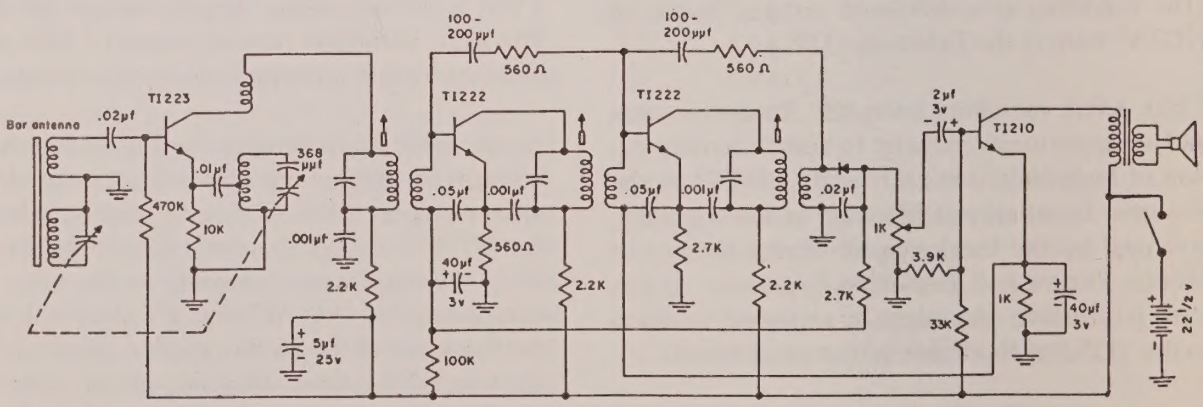
The other "made-for" product was the Bulova Model 250, almost an exact duplicate of the TR-1. Its cabinet is identical except for the omitted jack. The Bulova logo replaces the Regency emblem but the radio is the same in every other way. Because of the small market share which



The Bulova Model 250.

Bulova had, this set is extremely rare, and is even harder to find than the Regency TR-1.

Both sets are four-transistor superhets employing a autodyne converter (an innovation patented by



Schematic diagram.

(Continued on p. 34)

THE VACUUM TUBE

EDITED BY

BRO. PATRICK DOWD, F.S.C.,
W2GK

CONSTRUCTION DETAILS ON THE WECo 416 FAMILY

(Excerpt from an AT&T Long Lines publicity flier. The 416A was released on July 7, 1948.)

REMARKABLE TUBE AT THE HEART OF THE BELL SYSTEM RADIO RELAY SYSTEM

When Bell System engineers were planning the construction of a transcontinental radio relay system, to transmit telephone conversations and television programs, it became clear that an electronic tube of an entirely new type was necessary to make the network function. Yet, not only was such a device unavailable, but the exacting requirements involved were unheard of in vacuum tube design. In fact, there was even speculation as to whether such a tube was possible.

This challenge stimulated scientific imagination and ultimately new conceptions in precision design resulted in the creation of a unique electron tube by the Bell Telephone Laboratories. In turn, the manufacturing skills and methods of the Western Electric Company were put to the highest test and this matchless tiny tube, called the 416A, came to life. Technical and industrial daring had made possible the far-flung radio relay network of today.

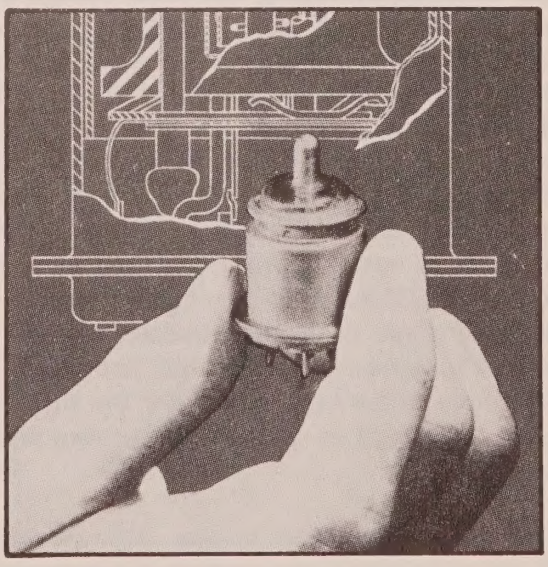
Essentially, the Bell System electronic mite has only the three parts of any triode vacuum tube - cathode, grid and plate. But at this point all similarity ends, as the following astonishing specifications suggest:

The gap between the grid and the cathode must be only about as wide as one-sixth the thickness of a piece of letter paper. Put another way, it would be necessary to split common thread lengthwise 20 times to secure a wisp tiny enough to be fitted into the space between the cathode and the grid.

The wire itself must be so fine that 60 strands put together would make a cable no thicker than a human hair. This wire has to be mounted on the grid support 1,000 threads to an inch and evenly spaced, and must be fastened in such a way that the material used to hold it will not unduly increase the overall thickness of the grid structure.

Gold is used for this fastening, but the usual method of plating does not give a sufficiently thin, even coating. Instead, gold wire is disintegrated into a vapor which coats the grid frame and the wires. The size of the Bell System's 416A tube, incidentally, is graphically suggested by the fact that a hypodermic needle is used to apply a drop of cement on the first and final turns of its grid wire.

The cathode of this flyweight tube is coated with a chemical which throws off a stream of electrons when heated. Normally, this coating would be applied with a spray gun. However, the surface roughness of the conventional coating - microscopic bumps and hollows - turned out to be greater than the space permitted betwen the grid and cathode. So a machine was developed by the Western Electric Company which sprays the cathode with a coating so fine that these bumps and hollows are no greater than two 100,000ths of an inch. In other words, it would take 50,000 such bumps to make a stack as high as a one-inch ant hill.

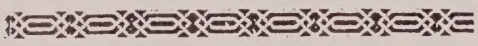


(Continued on p. 20)

WECo 416 (Continued from p. 19)

This is only one example of the machines it was necessary to develop for this "close-spaced triode" tube in which the component parts are almost unbelievably minute and the tolerances, or allowances for error, fantastically small. Another example is the machine developed to etch wire chemically to reduce the threads to gossamer thinness. Then, there is the grid-winding machine which feeds out this wire under constant tension. A delicate task - for the minute wire is like the thread of a spider and will break at a pull of three-quarters of an ounce.

By the application of such manufacturing ingenuity, this remarkable tube has emerged from the laboratory and is turned out by the thousands.



MORE ON "THE GOLD-PLATED 416B TUBE"

Ludwell Sibley, KB2EVN

J. K. Bach's article on the Western Electric 416B triode (OTB, May 1988) goes a long way toward telling the story of this remarkable device, but a few more details may round out the picture.

The 416-type tube (developmental number 1553) was refined through A, B, C, and D versions during its useful lifetime. Over the time span from 1947 to about 1977, its output power at 4 GHz went from half a watt (416A) to one, two, then five watts (416D); the last power increase was obtained by raising the plate voltage and making other circuit changes. During this interval, the TD-2 microwave radio system that used the 416 was uprated progressively from 480 voice channels' capacity to 1800. A great deal of the improvement came through other circuit changes, solid-state IF amplifiers and microwave carrier generators, for example, but the five-watt power level was a sizable factor. At the same time, the TD-2 system's reliability improved, from using two protection channels to back up ten working transmitters, to using one-for-eleven protection. The 416C version of the tube was good for 20,000 or more hours at two watts' output.

The transconductance of the 416-type tube, 50,000 micromhos, was extraordinary even in comparison with "hot" commercial tubes: the 6CW4 nuvistor, for example, delivered "only" 12,000. This high performance, coupled with the good shielding of the 416, made it an excellent low-noise preamplifier tube. A few lucky amateur VHF operators in the Fifties built 416B preamps for two meters, where the low noise figure of about two decibels was unapproachable by any other tube. (Yes, now you can beat that performance with an inexpensive transistor . . . thirty years later.) The 416B was used in the late Fifties over the 200-300 MHz range in the military AN/APA-2 radar preamp, a few of which later came into the hands of amateurs.

Bach's text is not fully correct in describing the TD-2 transmitting amplifier (transamp) as originally being a two-stage affair; there were three stages from the start. There was one experiment at Bell Laboratories in which ten TD-2 transamp stages (30 416As) were bolted together in tandem: possibly a try at making a non-heterodyne (on-frequency) microwave repeater. The ten stages gave about 90 dB of gain, roughly the right amplification for such a purpose. Contrary to the Bach article, the biasing arrangement in the amplifier was conventional: a DC ground on the grid, and a cathode resistor for biasing.

The original TD-2 system used 416s in the 4-GHz microwave carrier supplies as well as the transamp. When the TD-3 microwave system was designed in the mid-Sixties, it used a traveling-wave tube as the transmitting amplifier instead of the 416-type triode. But when a later version titled TD-3D came along, the designers went back to the 416. It was simply hard to beat for reliable performance at an affordable price.

The full story of the 416 family is documented well: in three articles in the October/November/December 1967 and July/August 1968 issues of the "Bell Laboratories Record," in "Design Factors of the Bell Telephone Laboratories 1553 Triode" in the October, 1950 Bell System Technical Journal, in "The TD-2 Microwave Radio Relay System" in the October 1951 BSTJ (with full details on the transamp assembly), and in A History of Engineering and Science in the Bell System - Electronics Technology (1925-1975). What was the fate of this remarkable device? The TD-2 transamp was eventually replaced by a gallium arsenide integrated circuit. Of the 150,000 416-type tubes that were once in use, the remaining few are doomed by AT&T's current drive to retire its last analog facilities.

-OTB-

SECOND-GENERATION GRUNOW

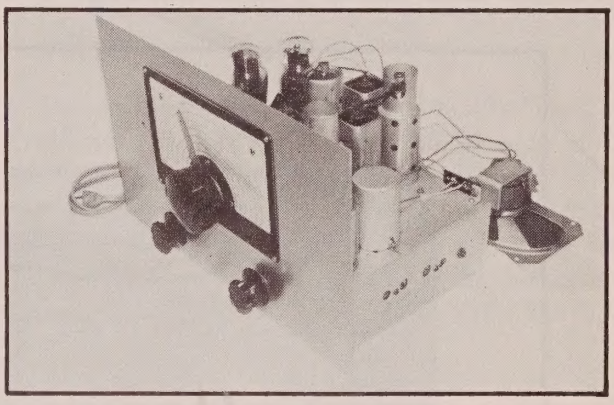
REVAMPING AN EARLY BROADCAST RECEIVER

Rodney Schrock, KA3NMJ

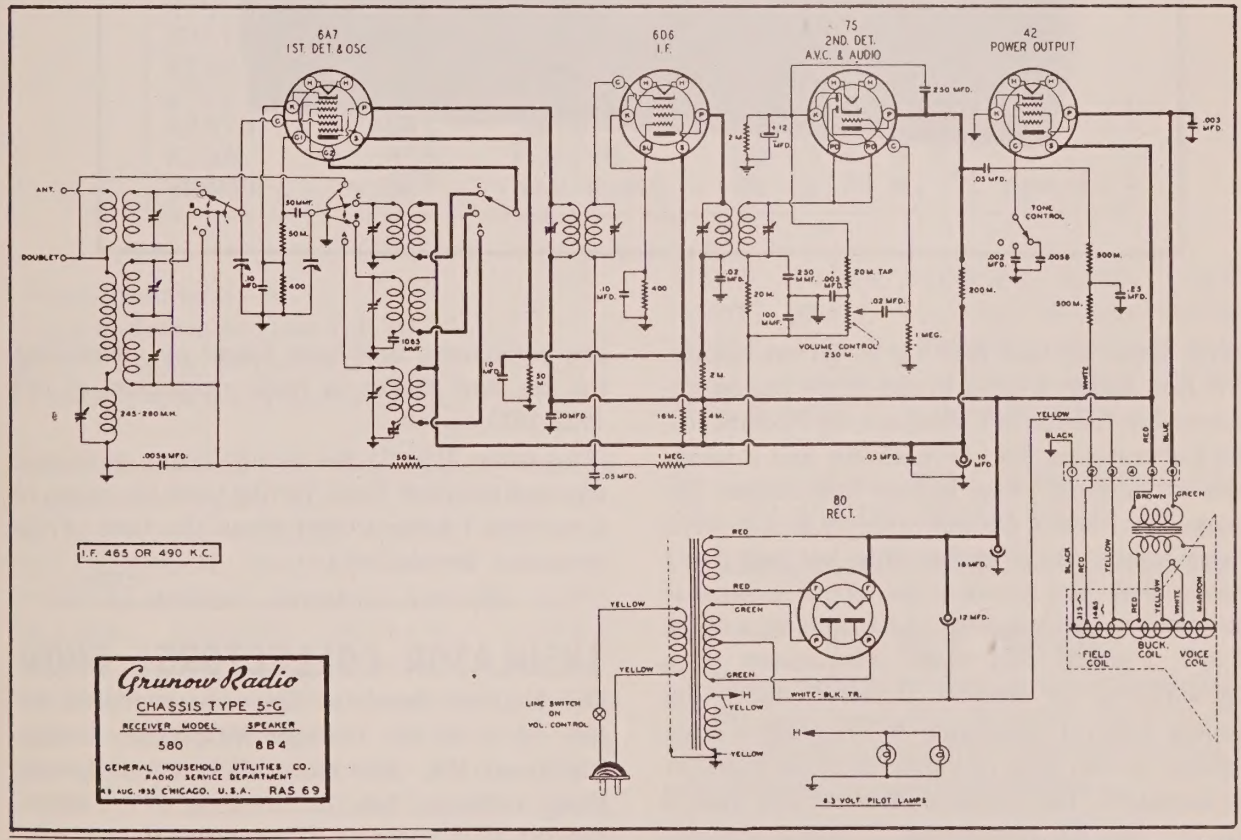
This article covers what I call my second-generation Grunow, the first being the four-tube superhet described in the March, 1985 OTB.

I have always been fascinated with the last generation of sets and tubes previous to the introduction of the octal series in the mid-Thirties. Some of these sets were "high tech" for their day, with such advanced features as three- or four-band operation, AVC, AFC, elaborate push-button tuning, hi-fi audio, and wide/narrow IF bandwidth, as well as six- and seven-prong multipurpose tubes. It was this generation that furnished a lot of tubes and parts for building my early "creations."

Some years ago, the thought of building a five-tube three-band set of this era came up. The first set that resulted was from an RCA schematic (chassis 85T) found in Rider's Volume 8, p. 109. It used a 6A7 converter, 6D6 IF stage, 75 detector/audio, 42 output, and 80 rectifier. For the tuned circuits, I used the coils from a small Zenith chassis. Its performance was average, it having been necessary to resort to cut-and-try methods to get the proper padder condenser for the 5-18 MHz SW band. There was some loss in the BC antenna coil; I blame this on its design. If you build and aren't satisfied with the antenna circuit loss, use an iron-core coil like the Meissner 14-1026. It makes a world of difference in performance.



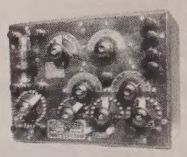
Being rather satisfied with the performance of the "RCA," I probably wouldn't have built another of these sets had I not come upon the remains of a Silvertone three-band battery superhet. It had the proper coils for another project: LW (weather band, 150-400 kHz), BC, and 5-18 MHz SW.



*402 Lincoln St., Somerset, PA 15501

(Continued on p. 27)

EARLY EQUIPMENT PROFILE



EDITED BY
LAUREN PECKHAM
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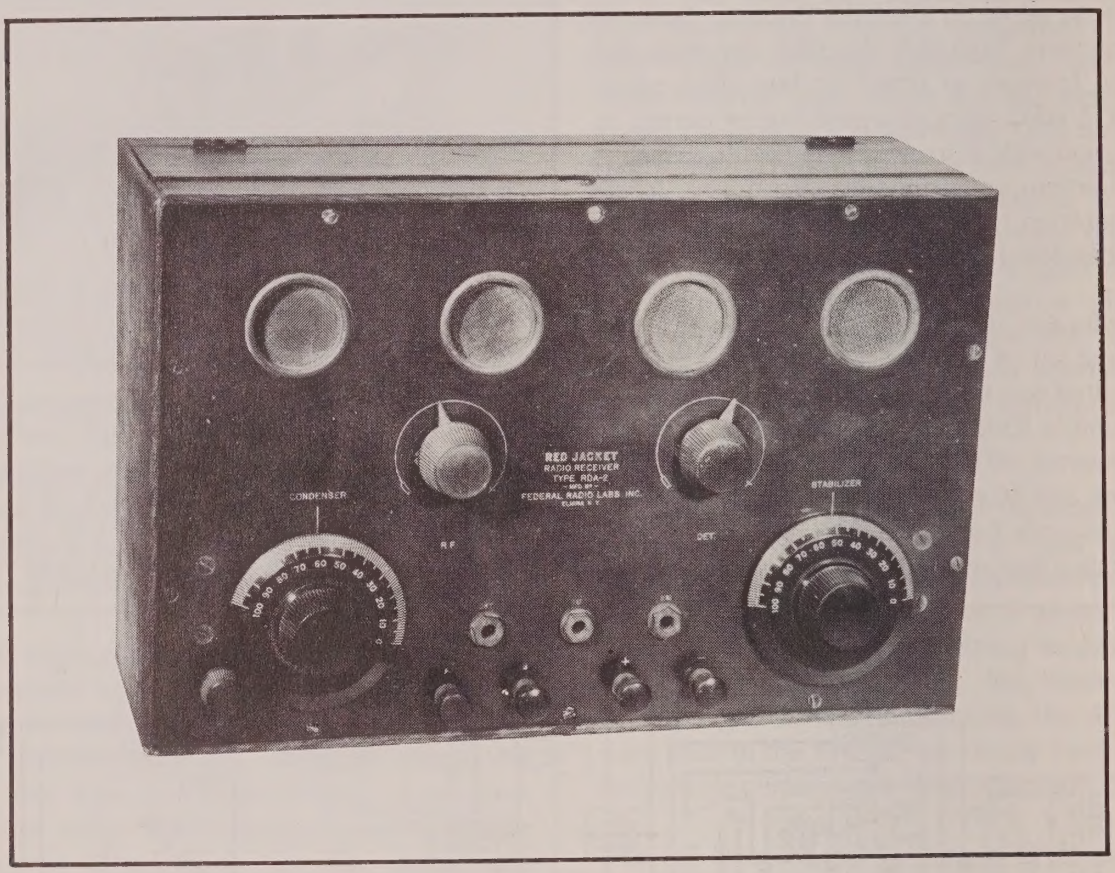
All correspondence requires SASE for reply

A FEDERAL RECEIVER THAT ISN'T A FEDERAL?

All collectors of early broadcast receivers have favorite sets. Usually these are from such well-known companies as RCA, Grebe, or Crosley. However, every once in a while an odd-ball receiver turns up that just has to go on display. The Red Jacket RDA-2 in the photo was manufactured in Elmira, NY, near me, by Federal Radio Laboratories, Inc. I've always had a weakness for unusual panel layouts and cabinet designs. The Federal fits this category as it is 9-1/2 inches tall by 14-1/2 inches wide, but only 5-1/2 inches deep. But a look at the circuit shows that only the cabinet is special. After making a quick sketch, I noted that many components were manufactured by another "Federal" outfit, the familiar Federal Telephone & Telegraph Co. of Buffalo! In fact most of the parts can be found in the model 57. The circuit is identical with that of the 57. The RF transformer is typical Federal with a tubular housing and clip-in mountings. The audio transformers and tube sockets are also Federal of Buffalo. So far, I have no idea whether there was any connection between the two companies, and have found no advertising for the Red Jacket in radio magazines of the 1922-1923 period.



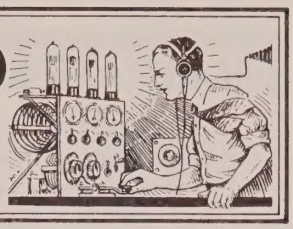
[The name Red Jacket is significant in central and western New York, having been the name of a renowned Seneca chief about the time of the American Revolution.]

-OTB-

INSULATOR COLLECTORS' SHOW

The National Insulator Show is scheduled for July 14-16 at the George Washington Lodge, Allentown, PA. For more information, contact Doug Williams, Box 12, Johnson, NY 10933, 914-355-1692. [BK]

AMATEUR RADIO



EDITED BY
KEN GARDNER, W2BGN
42 Oakdale Ave S. New Hartford, NY 13413
All correspondence requires SASE for reply

1989 OLD TIME CW CONTEST

A Memorial to Linc Cundall, W2LC

Persistence and hard work really do pay off. Fran, W2VDI, has been moving up the lists during the last few years and topped out in first place this year. (He says his ears still ring and his fist twitches at times.) Congratulations, Fran. Runner-up Charles, K4TS, became a Silent Key in February. His rollicking fist will be sorely missed in contests to come.

Short skip on all bands did not foster many long-haul contacts, although W6DJX, with under ten watts, worked W1DX on both 80 and 40. W1DX used 90 watts. He worked W2ER on 40; N4FS using 10 watts on 40; VE3AFW using a little over 100 watts on 80; and WB4OUF with under ten watts on 80. WB4OUF was using a single 45 tube. All in all, it was not a good year propagation-wise.

W7OD squirted over 100 watts toward W2ER using 90 watts on 40 and W4AIW using over 100 watts on 40. J37XC sprayed Zone E and Zone W with 95 watts. His best DX was K2WW/7 working 20 with 100 watts. Cuz made numerous contacts in Zone 1 on four bands.

There were 99 contestants - 89 submitted logs; 10 did not (shame!). I received 46 letters and 15 notes written on logs. Eleven protested vehemently about the new hours and four voted in favor. However, 15 stations operated during the first QSO period but only two during the second period. Did we all have fun in '89? Yea and verily! See you in '90!

73, Ken, W2BGN

STATION	SCORE	RECEIVER	TRANSMITTER
W2VDI	1524	HQ 120	160-80-40 m, 9 W*
K4TS (SK)	1381	Super Pro	All Bands, 9 W
N4FS	1272	SP-200	All Bands, 10- W
W2UK	1168	HRO	All Bands, 9 W
W2LYH	1164	'38 HB	All Bands, 9 W
W8AU	1098	SX-28	All Bands, 40 W
W2ER	1050	RCA	All Bands, 90 W
N3AYU	1041	SW-3	80-40-20 m, 70 W
K2OA	936	HQ-120	80-40 m, 8 W
WB4OUF	827	Sky Buddy	80-40-20 m, 45 osc.#

Total Contestants: 96
Congratulations to **Fran, W2VDI**, No. 1!
R.I.P., Charley, K4TS, No. 2
WB4OUF QSOed W6DJX on 80 m.

Other contestants, listed in decreasing order of score, were: W2AN, KC0CW, WB9K, W4VBX, J37XC, W2LV, VE3CLX, W2BGN, WB2MVK, K2LP, W2IXH, W3HWT, W2FW, K2BBK, W3VVS, W9POC, W8BFD, W6DJX, W2FB, W3OER, KB1MW, VE3AFW, W1WXZ, N2FCZ, W1BPI, W1YJ/4, K8VBL, W2AAU, W3INV, W4NM, W1SZJ, K4MOG, W2EG, K8KK, VE3AUI, W5IRP, W1DX, W6TXR, KA8DKT, VE2SEI, W4AIW, KE2O, K5CF, W8CZR, W2FCH, K6TDP, W7SEH, N9TT, W1BVL, W2FYU, KA3GXP, K7YIR, K2WW/7, W8AQ, W4OTB, WD8OFB, K6SO/4, AF3V, W9GJS, KB3SI, WA5VLZ, W7OD, W4CBG, W6IQE, W7LOG, W1AW, NM0L, W1GSO, W2LL, W4AWS, W3RG, W7JY, W1MB, W7BCT, W2EJ/7, W2RFY, K2RY.

No log submitted: K2IC, K2MP, W3ZIP, K4IX, K6AAW, W6HDO, W6SKQ, N6VT

-OTB-

CW NET MOVED

With our present position in the sunspot cycle, it has been necessary to move the 4:00 PM AWA Morse network from 3584 kHz to 7050 in the interests of better propagation.

ORGANIZATIONS, THEN ORGANIZATIONS WITHIN ORGANIZATIONS

In the beginning there was chaos in ham radio. Local neighborhood groups formed to promote the hobby, then city-wide or county-wide groups became established as radio clubs. Shortly a nationwide organization came into being - the American Radio Relay League. These all satisfied the serious side of the average ham. But within each there dwelt a little fun-loving pixie who also sought expression. Hence, within the ARRL, at national conventions, the initiation into the Royal Order of the Wouff Hong came about. In QST, the official organ of the ARRL, the beloved character TOM (The Old Man) and the cartoons of Gil tickled the ribs of our pixies.

Local clubs had their fun groups - initiation into the Order of the Water Cooled Tech - the Royal Order of S--- (signal) Slingers - The Road Runners - The DX Hounds - The Tennessee Mountain Antenna Water Witchers and on ad infinitum.

The Antique Wireless Association, founded by Cundall, Batterson and Kelley, satisfies the historian and the collector in all its serious aspects. The pixie in us laughs at Mel Comer and some of the facetious remarks made by our "serious" conference speakers. The AWA Old Time CW Contest and the Fall 1929 QSO Party entertain our pixie and provoked the brain child of Lou Mateo, WB2MVK, into establishing the "Junkbox Wireless International Club." Copies of the picture and certificate and excerpts from the letters of Henry, N2FCZ, tell the story better than I can. -W2BGN

From Henry Bookout, N2FCZ, explaining the "Junkbox Wireless International Club" certificate presented to him by Lou Mateo, WB2MVK: "My Hartley is not only a real and working transmitter but is chirpless, clickless, driftless, never QSLed by an OO, and the winner of 24 contacts in the AWA October QSO Party. I built it naiively but with almost daily technical assistance on the air from former RCA dignitaries W2UK, W2ER, W2LYH, and W2FET. It is not a hoax. The diploma was Lou, WB2MVK's idea. The JWIC really exists, with two members, Lou, founder, etc., and me as its sole member, honoris causa. By virtue of their signatures, Popoff and Morse have been grandfathered membership. Chiquita is the chartering institution. Patent for my rig is already held by Mr. Hartley. I believe JWIC would be glad to have AWA as an affiliate organization but you best take up this matter with Lou who handles all matters concerning eligibility."

-OTB-

RADAR HISTORY

There's a movement afoot to preserve and promote the early history of radar. Objectives are to publish the history of early systems, provide a forum for the exchange of information, establish a locator file on surviving equipment, and encourage radar exhibits. The address: Don Helgeson, RADARHIST - The Journal of Early Radar Enthusiasts, Box 3087, Skokie, IL 60076 (312-676-4629).

This seems like an eminently timely idea: radar has been around for 50 years now, considering the beginnings of the British Chain Home network, the German Freya and Wurtzburg radars, early Japanese designs, and the U. S. CXAS system. We haven't had much coverage of radars in the OTB, apart from the article on the SCR-270 in the December 1981 issue. [LAS]

THE RADIO HORN SPEAKER ENCYCLOPEDIA

Floyd Paul's compendium, published in November of 1986, has been distributed nearly worldwide. Orders for the book have come in from four continents. A bookstore in the Netherlands stocks it. Antique Electronic Supply in Phoenix and Vestal Press in Vestal, NY, have purchased several hundred copies each. Most of the original printing of 1,500 copies has been sold. Some minor updates to the book will be published in the OTB in the near future for purists who want to keep their copies current.

This reference is available (still) from the above-referenced suppliers or from the author/publisher, Floyd A. Paul, W6THU. Send $13.90 (includes shipping and handling) to 1545 Raymond, Glendale, CA 91201. [BK]

BOOK & MAGAZINE REVIEWS

by Bruce Kelley

THE HISTORY OF ENGINEERING AND SCIENCE IN THE BELL SYSTEM SERIES

Between 1975 and 1985, Bell Telephone Laboratories produced a series of histories detailing advances in communications technology brought about by the now-vanished Bell System. The OTB reviewed the first of these when it appeared, but the six other volumes came out quietly and have received little notice. Fortunately, all but one are still in print. Here is a summary of the series.

A History of Engineering and Science in the Bell System - The Early Years (1875-1925), 1073 pp., 1975. This first volume covers telephone and electronics development carried out before Bell Labs was formed, by the Development and Research Department of AT&T and the Engineering Department of Western Electric. Telephone collectors will enjoy this work; they will be able to date large numbers of WECo telephone sets from it. There is much detail on the early development of the vacuum tube, starting at AT&T's purchase of telephone repeater patent rights to the DeForest audion. Radio development - transatlantic, military, air-to-ground, early broadcast - receives considerable attention. Aspects of telephone technology beyond station sets - transmission, switching, cable development, etc. - are covered well and enjoyably. The early teletypewriters, Models 12 to 19, are included. This is probably the first-choice volume for the typical AWA member.

A History of Engineering and Science in the Bell System - National Service in War and Peace (1925-1975), 757 pp., 1978. The second volume covers military developments: detailed treatment of radars that Western Electric built before and during WW II, electronic gun directors, sonars, acoustic torpedoes, the Nike series of air-defense missiles, guidance systems, the Safeguard ICBM-defense system, the Sandia Corporation and nuclear weapons, special NASA projects, etc. Depending on one's technological interests, this is a good choice also.

A History of Engineering and Science in the Bell System - Switching Technology (1925-1975), 639 pp., 1982. By 1925 the "panel" switching system was in wide use in major cities and the step-by-step principle (the Strowger switch, to fans of Independent telephone history) was coming into its own in smaller places. Still to be developed were the crossbar systems of the '30s (No. 1) and '40s (Crossbar Tandem, No. 4, and No. 5), the experimental electronic units of the '50s, the commercial electronic designs of the '60s (No. 1/1A and 2/2B), and the later digital systems. Telephone enthusiasts will appreciate the coverage of PBXes of this period. For the reader who wants some switching history, this is a good treatment.

A History of Engineering and Science in the Bell System - Physical Sciences (1925-1980), 674 pp., 1983. More arcane than the others, this volume covers BTL research in chemistry, physics, and materials science. Examples having application far beyond the telecommunications business include semiconductors, glasses, polymers, plasmas, and quantum electronics. The book includes coverage of the genesis of the transistor written by Walter Brattain, who shared a Nobel prize for it and who died in early 1988. This is the volume that recently went out of print, but it is likely to be available in technical libraries.

A History of Engineering and Science in the Bell System - Communications Sciences (1925-1980), 521 pp., 1984. The topic here is a spectrum of sciences related to the communications industry: acoustics, mathematical theory, vacuum-tube design, radio/microwave propagation, antennas, picture transmission, computer science, economics, waveguide and lightguide (fiber) transmission, and even behavioral science.

(Continued on p. 26)

BOOK REVIEWS

(Continued from p. 25)

A History of Engineering and Science in the Bell System - Electronic Technology (1925-1975), 370 pp., 1985. The history of device development picks up here from Vol. 1. There is a highly informative chapter on the design of WECo tubes for audio, broadcast, radar, microwave, and general communications use, including klystron and magnetron development during WW II. There is, not surprisingly, substantial coverage of the discovery of the transistor effect in 1947 and the endless efforts required to go from a laboratory demonstration to a reliable commercial product. The junction transistor, a line of diodes, and early BTL integrated circuit history are described well. So are the development of resistors, capacitors, relays, lasers, magnetic memories, thin-film circuits, and other components: not as glamorous as active devices, but good reading.

A History of Engineering and Science in the Bell System - Transmission Technology (1925-1975), 812 pp., 1985. This is the story of transmission systems: overseas radio, broadcast transmitters including the Doherty amplifier, submarine cables, carrier and microwave systems, mobile radio, fiber systems, the Telstar satellite, etc.

The price of each of the six available volumes is $47.00. They were produced by the publications staff of Bell Laboratories, drawing from the corporate archives. Hard-bound, well supplied with photos and drawings, they are carefully indexed and contain detailed references. If there is any criticism to make of the series, it is that a given topic may be covered in more than one volume. As mentioned before, value to the individual looking for technological history depends on personal tastes, but Vols. 1, 2, and 7 are of particular interest. (Vol. 1 is the real bargain: where else can you get 1000-plus pages of good history for that price?)

These books are orderable from the AT&T Customer Information Center, 2855 N. Franklin Rd., Indianapolis, IN 46219. Easier than that, their telephone is 800-432-6600, and they take credit cards. The "select codes" for ordering purposes are 500-467 to 500-473 for the seven volumes respectively. [LAS]

OTHER NOTES ON BOOKS

We set out to print the ordering code for the excellent history of radio development at the National Bureau of Standards, as reviewed in the August, 1987 OTB. (NBS is now the National Institute of Standards and Technology.) The stock number is 003-003-02762-6 - but as of late November it was out of print. The status of this or any other Government Printing Office publication can be determined from the ordering desk on 202-783-3238.

In a more positive vein, the second volume of Alan Douglas' Radio Manufacturers of the 1920s is currently in printing . . . stand by . . . [LAS]

RÖHRENCODIERUNGEN DER 20ER UND 30ER JAHRE (TUBES OF THE 1920s AND 1930s - NUMBERING SYSTEMS AND DATA)

By **Gerhard Salzmann**
Reviewed by **Alan Douglas**

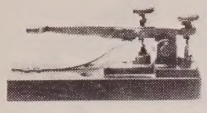
For anyone interested in European tubes or radios, this book will be indispensable. With dozens of makers in various countries producing their own lines of tubes under unique numbering systems, the variety to be found is bewildering. Tube manuals and substitution guides have, of course, been published before, notably P. H. Barns' Vade Mecum (very loosely, "Handbook") compilations. But as often as not, a particular 1930s (let alone 1920s) type number is nowhere to be found.

As the author points out, this new work cannot be considered complete either, but it comes as close as anyone is likely to get. Fragmentary data from many sources has been assembled in one place, from "cracking the code" for makers' type numbers, to condensed tables of tube characteristics, an interchangeability guide, and more. Sinces the sources were fragmentary, the book may seem loosely organized. Some makers are well covered while others are barely mentioned. But even a little information is better than none, and the best covered manufacturers are those most likely to be wanted.

The book is in German. While much of the data can be understood without any knowledge of the language, a recognition of at least some technical terms and abbreviations will be very helpful: "gitter" for "grid," "gleichrichter" for "rectifier," that sort of thing. There is little text, as such, requiring a knowledge of grammar for translation.

(Continued on p. 44)

KEY and TELEGRAPH



EDITED BY
LOU MOREAU
W3WRE

THE KEY FORUM

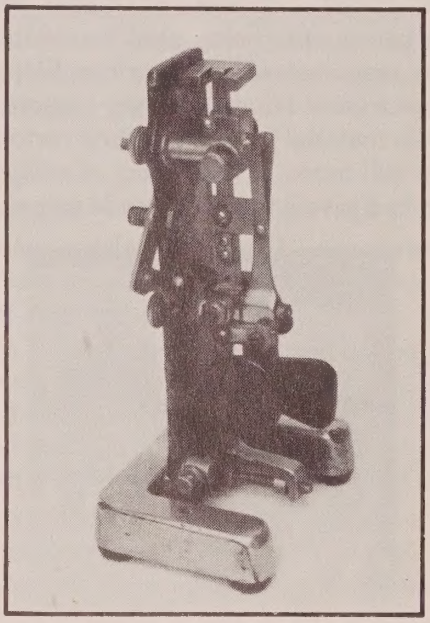
QUESTION: I have a small collection of keys. People ask if I have a "vertical bug." What is that?

ANSWER: The term "vertical bug" more-or-less identifies the physical appearance of this type of semiautomatic key. One of the three best known styles is the Coffe invention of 1906 that was picked up by Clarence Bellows and Ambrose Behner to become the Mecograph the next year.

About 1911 there was a key attachment known as the Vailograph. It had been patented in 1908 by a Frank T. Vail and was produced by the International Vailograph Company of Minneapolis. It was really a strange design, with a vertical stile, that attached to a straight key and was worked by a standard hand knob. It was unique (and also hard to operate) because one pulled up on the knob to cause the vertical section to produce dots, then pushed it down to make each dash manually. It was not on the market long.

Then, around 1917, there developed a need to fit a key (or several keys) onto the crowded desk of a wire chief, so Horace Martin produced his fifth invention. It was advertised by Vibroplex as the "Upright" model and also as the "Wire Chief's Key." It used one contact for dashes as well as dots: a stop held it stationary for manual dashes but released it for the dots. The users promptly named it the "vertical bug."

Any of these could be called a vertical bug, since that is a generic term. They are all hard to find, but the rarest are the 1906 Coffe and the 1911 Vailograph. I have never sees a Coffe, and the only Vailograph known to exist belongs to Bill Suter in Dallas.



1917 Upright Vibroplex. Also advertised as the "Wire Chief's Key," this semi-automatic was Horace Martin's design for a key to fit the crowded desk of a wire chief. Note: key shown is a left-handed model. Photo: W3WRE Collection.

-OTB-

Grunow (Continued from p. 21)

For the circuit, I chose the Grunow chassis 5G, Grunow diagrams having basic circuitry, being easy to follow, and providing good performance.

The Band 1 antenna coil had a burnt-out primary which I replaced with a winding from an old IF transformer. In wiring the set, I put the Band 1 coils in the Band 2 position; in case I didn't like their performance I could install a SW band in sequence with the others. After some alignment, the set worked quite well. Band 2 (LW) had mainly aircraft beacons, recorded notices to aviators, etc. I substituted BC antenna and oscillator coils which, by removing turns and juggling padders, added another SW band.

I made some minor changes such as employing a separate bandswitch gang for selecting antenna primaries, substituting a 300-ohm ten-watt resistor for the 315-ohm section of the field coil, and using a no-frills volume control circuit. The performance of the set is very satisfactory.

-OTB-

THE LOUDSPEAKER

EDITED BY
FLOYD PAUL, W6THU
1545 Raymond, Glendale, California 91201
All correspondence requires SASE for reply

MIDGET HORN SPEAKERS

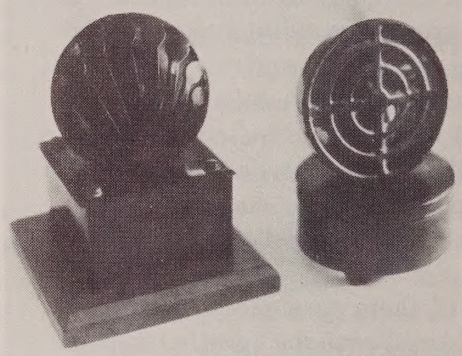
In the spring of 1925 the midget horn speaker appeared. Three companies marketed this design. They were novelty items, performing poorly when compared to horns with larger air columns. The midget was small, pretty, and reasonably priced. Pyralin, a DuPont cellulose-nitrate plastic, was being used by several horn-speaker manufacturers. American Electric and Grigsby-Grunow-Hinds, among others, were using the material to produce their tortoise-shell colored-bell horns. The makers of midgets used Pyralin and gave it their own trade names.

The first firm to announce a midget speaker was Rice & Hochster. A "Radio Retailing" magazine listing in March of 1925 noted that the company made two small horns. One was a cabinet model; the other, a 3" wide and 4-1/2" high horn. This speaker qualifies as the smallest horn type ever made. It was tortoise-shell colored material.

The second company to announce a midget horn speaker was Piroxloid. The first ad ran in the April, 1925, issue of "Radio Industry" magazine. A search of patent records showed this to be the only midget to have a patent issued. Design patent no. 67,217, taken out by a Hugo Monovill of New York, was assigned to Piroxloid Products Corporation of New York. The first announcement of this horn was that it came in tortoise-shell color, but a later ad noted that "grained ivory" was available as well. (Now, how does one effectively grain an ivory? Well, the company did it!)

The third producer, Tower, had been a large maker of horn speakers and was about to come to market with a line of magnetic cone speakers. In December of 1925, Tower's first ad appeared, showing a cabinet-style horn speaker with a Pyralin grill in the front. The next month, a picture of the midget shown in this article appeared. It seemed to be patterned after the Rice & Hochster design, not the Piroxloid model. (I'm sure some market research showed Tower that the Rice & Hochster design was more marketable.) Very few ads were found on Tower's midget. The author concludes that the company didn't promote it much and the item did not sell well, and by mid-1926 the marketability of midget horns was over. (Among other reasons, the magnetic cone speaker had entered the market place and was doing well.)

-OTB-



The pictures show a tortoise-shell Rice & Hochster, a tortoise-shell Tower, and an ivory-grained Piroxloid Operatone. Each is slightly taller than a deck of Atwater Kent playing cards.

Company	Model	Term for Material	Height	Base
Rice & Hochster	Reflectone	Pyroxia	4-1/2"	3" square
Tower	Midget	Pyroline	4-3/4"	3" round
Piroxloid	Operatone	Piroxloid	5"	3" round

THE MAILBAG

Comments from readers are welcome on any subject of interest in the field of early wireless communications. Because of space limitations, letters which are published may be edited. Send all material to the Editor, OTB.

I found your two-part article on the W. E. 9-series aircraft receivers [August and February issues] especially interesting, as it brought back some fond memories of youth in which the 9B was involved in a peripheral way. In 1937, not too long out of high school, I worked at the Syracuse, NY airport. In those days there was only one airline flying into Syracuse, American. Being a ham, I was naturally interested in the ground station used to talk with their flights.

The station, as originally set up, consisted of an 8A aircraft transmitter and 9B receiver running off storage batteries and a charger. But at some point the 9B got relegated to a storage room and was replaced by a home-style, semi-cathedral "all-wave" table radio of the type popular in those days. The crew claimed that this "worked better" than the 9B. I suspect that what they really meant was that it was more convenient - the "all-wave" receiver had speaker volume, gave AC operation, and did not require changing plug-in coils for day/night frequencies. Of course, it had an "airplane" dial. Ha! At any rate this combination of polished walnut and "black boxes" seemed to work out fine. "Loud and Clear" was the usual signal report. **Frank Kohl**, W4NM

I don't think any article on the S-38 (Nov. 1988 OTB, p. 38) would be complete without a mention of the Lafayette HE-10, or KT-200 in kit form, a direct style copy of the S-38 but a better receiver in many respects. Lafayette's builders in Japan copied the distinctive vertical semicircle dials of the S-38, but in a receiver about 20% larger. It used heavy-gauge metal, in an excellent wrinkle-grey finish, with one RF and two IF stages, antenna trimmer and S-meter. It also had a hinged top opening for easy tube changes. Price: $79.95/$64.50, as advertised in QST, May 1960, p. 153.

It was my first receiver, chosen after consulting an article with feature comparison charts in Radio-TV Experimenter. First receiver, but I have no desire to own one again - too drifty and with poor dial calibration, in common with all two-dial tube shortwave sets.

Wish my dad had gotten me a BC-348 instead - now there's quality construction and value for the money - but we didn't know things like that existed. **Hugh Miller**, KA7LXY

(From a letter to Bruce Kelley):
Your In-House article about museum thefts (February OTB) was something! I wonder if you saw the recent news articles re the so-called "high-tech" gang of western New York and the sentencing of one or more of those characters after a long history of investigations and trials, etc. These were the ones who specialized in burglarizing museums and others of high-value art works. **Charlie Grissinger**

The August AWA Bulletin had a most interesting article on the W. E. aircraft receiver. I was very surprised to see it as I have always thought that the equipment was a very obscure product . . . Perhaps my story will sadden you or the owner of the series-9 but it's not entirely gone. I was given one with its remote "sausage grinder" sometime between the late 1930s and late 1940s . . . one of the things we used to do in those days because we had no money was to take apart most everything for parts and hardware, etc. After all, there were a very large number of old battery sets everywhere as AC sets were then in use except out in the farming areas . . . One time, I will guess during the 1940s, I took the series-9 apart on what must have been a weak-minded day. Apart it came. All the pieces of major sizes were put in a box but I do not think I discarded anything. A few months ago a box fell from a stack and a few of the rectangular shield compartments showed up. I do have the remote intact, the cover and chassis which I recall was a casting, and likely could find most of the parts, the tubes also. The one thing I may not have are sockets; I think they were of strange design . . . I think it's fair to say I have a "basket case."

Funny thing, as a kid I knew Grote Reber and borrowed his microphone at times. You may recall that he had a dish in his back yard. Very spooky at the time - 1936-38, in Wheaton, Illinois. Grote is one of the true pioneers of space radio. He was studying the signals from deep space, worked for the Wheaton police as a tech, had the setup recording unattended as I recall . . . **Frank Newton,** W6SYG

-OTB-

HISTORICAL ARTIFACTS

Old-time ads are **free** to members interested in collecting and restoring early equipment for personal use. **The rules:**

1. Only **one** per issue per member. Include an SASE if acknowledgement is desired.
2. Material must be over 25 years old and related to electronic communication.
3. Give your full name, address, and zip code.
4. AWA will not repeat ads. Repeats require another notice.
5. The Association is not responsible for **any** transaction.
6. AWA retains the right to reduce the size of the ad if over **seven** (7) lines.
7. AWA does not accept commercial advertising.
8. Deadlines for ads:
   May issue - **March 10**
   August issue - **June 10**
   November issue - **September 10**
   February issue - **December 10**

Ads received after the above dates will be held for the next issue or discarded.

9. Mail **all** ads to:
   Richard Ransley
   17 Sheridan St.
   Auburn, NY 13021

(Do not sent them to Headquarters.)

WANTED

--Anyone interested in forming a club or association living in Ohio please contact Karl R. Koogle, 2929 Hazelwood Ave., Dayton, OH 45419 (513) 294-8960

--Meissner Signal Shifter, pre-war, working or repairable. Bill Skidmore, VE3AUI, RR 1, Hyde Park, Ontario, Canada N0M 1Z0

--Broadcast quality microphones, especially ribbon velocity. Carl Howard, 4603 Hunt Club Dr., #2D, Ypsilanti, MI 48197 Tel. (313) 434-0824

--Meissner 5 prong S.W. coils #18-3500, 18-3502,18-3503,18-3504,18-3505; J.W. Miller 1600 KC I.F. transformer #612-W4, slug tuned coils A-5495-A, B-5495-A, C-5495-A; Elmac AF-68 xmtr. Alvin Bernard, P.O. Box 690098, Orlando,FL 32819 Tel. (407) 351-5536

--Early quack medical devices, open bi-polar motors and dynamos, scientific

WANTED

items. Richard Cane, 8391 N.W. 21st St., Sunrise, FL 33322 Tel. (305) 741-6838

--Cosmo Radio, NY Mfg, circa 1948.Radio Electronics magazine, March 1949;Manual for Knight 'Space Spanner' 3 tube regen set. Jerry Talbott, 1440 SW 239th, Hillsboro, OR 97123 (503) 649-6717

--Kennedy Models 53,54 and 54A short-wave tuners. State price and condition. Stephen Short, 1590 Union St., Schenectady, NY 12309 (518) 346-2245

--Kaydette Jr. (International) radio. Circa 1932-34;Marantz Model 9 amplifier (1956);Dynaco Stereo 70 (1962). Want set or manual of any of above in any condition. Charles Graham, 4 Fieldwood Drive, Bedford Hills,NY 10507 Tel. (914)666-4523

--Philco Predicta TV with good picture tube. Also belt buckle with antique radio or victrola on it. Donald Newman, RT 1, Box 1136, Manchester,TN 37355

--Worlds Radio Tubes,Worlds Equivalent Tubes, Worlds Television Tubes published by Editors and Engineers. Also Riders XXII and XXIII. Dean Soderling, 6725 Portland, Richfield, MN 55423

--Philco 60 chassis complete. Have speaker & cabinet. Walt Curry, 10035 Country View Road, La Mesa, CA 92041 Tel. (619) 461-9327

--WWII military radio equipment-German, Japanese and Italian.Also some U.S. military and Forest Service sets. 1930's and1940's Electronic industries and aviation magazines,FBIS, Berne overseas station lists. Hugh Miller, KA7LXY, 6400 Maltby Rd.,Woodinville,WA 98072-8375

--old foreign and American bugs. Smiley White, P.O. Box 5150, Fredericksburg, VA 22403

--for Paragon RA-10: Two binding post knurled nuts, one vernier knob. Also WWII to present military vehicular communications equipment and components. Bill Kish, 800 West End Ave., New York, NY 10025 Tel. (212) 666-8857

--Atwater Kent speaker Model DB. Will pay top price. Dieter Bartenheier, 50A Park Rd.,Auckland 7, New Zealand

WANTED

--old and new novelty radios.Pay your price for tube type novelties in excellent condition. Also grandfather clock radios . Cliff Watts, 51 Glendale Rd., Brantford, Ontario, Canada N3T 1P5

--Wireless receivers and early battery sets.Also want Federal 61, IP-501.Trade HO-scale brass locomotives and professionally restored antique slot machines. Dave McClellan, 1085 Trailridge Lane, Atlanta, GA 30338 Tel. (404) 399-6704

--plastic dial cover for Echophone Commercial;manuals for SX-111,S53,SX25, Echophone Commercial.Also amateur radio QSL cards prior to 1950. Dave Noon, VE3IAE, 19 Honeysuckle Cresc., London, Ontario, Canada, N5Y 4P3

--Freed Eismann gold top audio xfmr type 377 (four mounting holes) as used in NR-6.Open OK; info on Erla Rely-O-Dyne recvr (5-01A's);tube shield assy for Philco Model 71A (covers 3 rf tubes and has model plate on rear).Model 70 shield OK. RCA Victor gold coloured logo as used on Model C-503 and others. Paul Rosen, 30 Cherrystone Dr., Willowdale, Ontario, Canada M2H 1S1 Tel. (416) 493-6962 evenings

--2 or 4 volume set of Everymans Guide To Radio by Yates, 1924. Tom Sokira, 69 Manor Drive, Cheshire, CT 06410 Tel. (203) 272-3638

--pre-1948 televisions,pre-1957 color televisions. David Smith 119B Hollywood Dr., Lynchburg, VA 24501

--BC-1031 Panadaptor.Also Hallicrafters S-35 panoramic receiver (1943-1946) has 5" panadaptor above SX-28. Also need 75A-2 and cabinet for SP-600. Sam Thompson, W6HDU, Box 101, Alameda,CA 94501 Tel. (415) 521-1429

--would like to buy or trade for telegraph bugs (speed keys) that I need such as Boulter,Leach Relay Co.,Brown Bros. (CSA),Hunter Apex,King & Co., New Have Clock Co.,Westinghouse Air Brake, or other oddball types. Gil Schlehman, 335 Indianapolis Ave., Downers Grove, IL 60515

--ZAHL Radar tube VT-158, 831 triode, tube sockets for 204A and Western Electric 212, info on Westinghouse CL-2 tube. Transmitter,industrial and special purpose tube manuals, Electronic Applications of the Smith Chart by Phillip Smith (1969), OTB's prior to Vol 19. John Walker, 16112 W. 125th St., Olathe, KS 66062 Tel. (913) 782-6455

--TBX-6 WWII Rec/Xmtr built by GE for Navy and used by Marines.Need any conversion data (understand an article was printed a long time ago in a ham mag.) Also any parts; mike, phones, key, power connectors,etc. S. Kiraly, 51 Ramon Blvd., Freehold, NJ 07728

--dial scale for Philco Model 37-650 (part No. 27-5212).Also need AK speakers, all types. Gary Chehames, 227 Clubhouse Drive, Willingboro, NJ 08046

--circuit diagram, operating instructions and any other info on a Globe Scout Model 65 CW/Phone transmitter made by World Radio Laboratories. George Clemans, 2120 Chapel Hill Rd., Apt. 6, Durham, NC 27707 (919)490-0773

--Wanted: Partner in crime! I have a restorable National SW-2 receiver in wooden cabinet as used in early scanning disc TV systems.Looking to team with someone who has discs, to enter a winning system in 1989 Conference contest. Or, will buy discs outright. John Nagle, 12330 Lawyers Rd.,Herndon, VA 22971 Tel. (703) 620-3066

--Colonial Globe radio, WE 216A tubes, AK nameplate for underside of Keil table lid. Top prices paid. Have Marconiphone VI cabinet. Gordon Wilson, 11108-50 Avenue, Edmonton, Alberta, Canada, T6H0H9

--tube sockets for tube checker. Need 3 of the 4-5-6 prong composite, 2 of the 5-6-7 prong composite, 1 of the 5-7 prong composite and 4 of the 7-7 prong composite. Jack Wallace 5516 Gilbow Ave., TX 76114 (817) 732-5189

--Atwater Kent breadboard radios and parts in any condition. Paul Thompson, 315 Larkspur Dr., Santa Maria, CA 93455 Tel. (805) 934-2778

--old spherical audions, early DeForest, Weagant and other unusual tubes in any condition for my collection. Will pay fair price or exchange. U. Radtke, Im Fuechtei 143, D-4830 Guetersloh, W. Germany Tel. 011/49/5241/51921

--Aeriola Jr. crystal set,Radiola 17, Regency TR-1 transistor set, table for 630TS TV.Must be complete, original and in excellent condition. Carl Baxter, 1133 South Clinton Ave.,Rochester,NY 14620 Tel. (216) 473-5322

500-kc plug-in crystal filter cartridge from an FB-7 National receiver, to replace a cracked element. I do not need the holder, only the crystal. Bill Fizette, K3ZJW, RD 1, Box 55, Henryville, PA 18332.

WANTED

--to correspond with someone familiar with the A-K Model 55. The set I'm trying to restore has some missing parts. Ron Schuller, 8524 Louise Dr., Mentor,OH 44060

--Navy receivers-could anyone coming to the BVWS/AWA meeting in June help an English collector? Want 2 buzzers, xtal det.,SE1071,SE1000,CN112 and other receivers.Will buy or trade very rare 1908 BTEM TX/RX,Marconi Mk.III tuner, V2,V3 and or English sets. Rupert Loftus Brigham, 38, Drayton Green, Ealing, London W13 0JF Tel. 01 997 8749

--Crosley radios from 1920 to 1952 and Crosley advertisments. Have 1948 Truetone phono/radio w/shortwave Model D1845 with good cabinet. Bud Morrell, 7151 Davis Rd., West Falls, NY 14170

--reproduction or copy of the instruction card inside the lid of a Federal Model 59. James Fisher, 344 Harrison Ave., Manville, NJ 08835 (201)725-7476

--pocket portables w/tubes; Belmont Boulevard,Privat-ear,Emerson 540,569A. 584,645,838,Tom Thumb TT600,Garod 4A-1, Signal 141,Regal 777,CBS S110,Motorola 45P1,HoffmanBP-402, etc. Mike Schiffer, 2718 E. 10th St., Tucson,AZ 85716 Tel. (602) 325-3532

--IP501,RJ4,RJ5,Marconi wireless sets, AK breadboards,chassis for Bullet,Grebe CR audios,binding posts for DeForest Everyman Crystal set,crystal detector for Aeriola Jr.,capacitor for 2A filter unit of SCR-68,Clapp-Eastham items: Blitzen recvr.,Universal Ferron Det., fixed condenser, Radion recvr.,Radion loose coupler,AF and D recvr. Howard Stone, 2825 6th Ave.,Fort Worth, TX 76110 Tel. (817) 924-9372 evenings

--photo of exterior door detail on Scott 'Secretaire' console. Wish to purchase Pioneer Model MJ Allwave receiver (1934-35), and Matthews TRF Superhet High Fidelity All-Wave recvr (1935). George Harris, 3212 36th St., Lubbock, TX 79413

--Collins R-390A communications recvr. Peter Kapp, POB 1620, Mendocino,CA 95460 Tel. (707) 964-0762

--Collins mechanical IF filters for my 75A3 ham receiver.Any bandwidth;3kc, 1kc,800Hz,etc.,type 455B series. Any help would be greatly appreciated. Charles Pierce, 4380 E. Brookhaven Dr., Atlanta, GA 30319 Tel. (404) 233-1340

--Regency TR-1,TR-2 or TR-3 transistor radio,Sparton 301 console,Fada piano, Kennedy Coronet, Motorola 68L11 AC/DC set. John Okolowicz, 624 Cedar Hill Rd., Ambler, PA 19002 (215) 542-1597

--1946 P.H. Brans' Radio Tube Vade-Mecum (or any other prior to the 1952 9th edition). Raymond Brown, 2095 Sloan St., St. Paul, MN 55117

--Collins 51S-1 receiver. Please indicate the condition of the unit. James Reid, W5HGL, 656 East Madison, Houston, MS 28851

--Eveready Radios, speakers and literature. Made by National Crabon Co. beginning in 1927. 16 models were made. Eveready collector of radios,flashlights, etc. Bill Utley, 7616 Brookmill Road, Downey, CA 90241 Tel. (213) 861-6247 evenings

--parts,schematic and 38233 type tube needed for restoration of Navy RU 16 aircraft receiver. Any help appreciated. R. Haworth, 112 Tilford Road,Somerdale, NJ 08083 Tel. (609)783-4175

--Televisions, old and unusual.Mirror radios,Catalins,unusual bakelites, novelty and transistors! I have 300 old TV's plus cash to swap for your items. Harry Poster, South Hackensack, NJ 07606 Tel. (201) 794-9606

--Crystal set collection now at 135 and looking for more sets. Erwin Macho, Ambrosweg 17/A/8, A-1230 Vienna,Austria

--reward for Harvey radio transmitter FT-30 (see FOS page 257).Also need picture,manual and roll chart for restoring an Old Confidence tube tester, Model C by Apparatus Design Co. Robert Enemark, Box 1607, Duxbury,MA 02331

--complete set of original knobs for 1949 Pilot 3" TV-37. Charles Mooney, 12309 Stafford Lane, Bowie, MD 20715 Tel. (301) 464-1994

--AWA Review Vol. I; manuals for Heath IT-11 Capacitor Checker;Eico 232 VTVM;Eico 1030 Power Supply.Copies for manuals OK. Bob Morrison, 1640 Mill Oak Dr., Va. Beach, VA 23464

--Riders Volumes 20 and 23. Originals only please. Dan Healy, P.O. Box 764, Woodacre, CA 94973 (415) 488-4596

--spark equipment wanted for club talks and any early spark info. Also QST before 1927. Edward White, WA3BZT, 2404 Hedgerow Dr., Wilmington, DE 19810 Tel. (302) 475-3355

DISPOSE/TRADE

--1933 Emerson Mickey Mouse radio;1936 Sparton Bluebird mirrored radio; 1960's Pepsi dispenser radio. Best offer on each. All work and are in exceptionally nice condition. Bob Lane,10332 Mohawk Lane, Leawood, KS 66206 (913) 648-5296

--Klitzen 1 tube Regen receiver,Uncle Al's crystal set.Other crystal sets. SASE for info. H.D. Utz, 3406 Kentfield Drive, Sacramento,CA 95821 Tel. (916) 483-9966

--WD-11's brass;Federal 61;electronic regulated power supply 5v,2A;G.R. 213 tuning fork osc.;Music Master Spruce bell (bell only);Radio Age magazines, Vol 1, No. 1 12 issues; DeForest D7A; Mother of pearl 1950's set. SASE for details. Floyd Paul, 1545 Raymond Ave., Glendale, CA 91201 (818) 242-8961

--manual for ASB-7/7A/7B Aircraft Radar (with CPR-46ACJ Receiver).Covers xmtr.,recvr.,indicator and all accessories.Original,not a photo copy. About 200 pages. $10. plus postage. Manual for AN/USM-25A & B Oscilloscope,original, about 100 pages $5. plus postage. C.F. Crandell, 3412 Rugged Dr., Dallas, TX 75224

--Faradon equip,SCR-59,Edison cylinder machine,early light bulb list and equip. list. Send LSASE w/2 stamps for list 89-1. George Potter, 2069 Sienna Trail, Lewisville,TX 75067 Tel. (214) 393-0020

--reducing collection of radios, tv's, test equipment. Send SASE for list. Want AK 84 junk chassis for parts.Also round Detrola. Dennis Smith, Box 113, Trenton, MI 48183

--original manuals for National HRO-7, -50,-60 $10 ea. ppd. Photocopies avail. for Hallicrafters HT-1,HT-9,S-20R,SX-25, S-27,Hammarlund SP-200-X,HQ-129-X, National NC-100,RCL and others. Sheldon Wheaton, 1120 Virginia Ln. #1, Olathe, KS 66061 Tel. (913) 764-5436

--hookup wire,cloth covered or rayon covered. 20AWG stranded,tinned. 100 ft. $5. plus $1.50 postage. 200 ft. $9.50 plus $2. postage. SASE for sample. Gerald Cromer, K4NHN, 1014 Summerland Dr., Cayce, SC 29033

--Atwater Kent Model 40 in excellent condition,very clean, with original speaker. $50 plus UPS;Hallicrafters S-38-D $40.;S120-R $40.;S53-A $50. all in working condition. Lou Sabetto, 1717 Burgess Rd., Cleveland,OH 44112 Tel.(216) 486-1036

--Baird Ltd. stock certificates dated 1930's.Was inventor of the mechanical TV scanner. (See Nov.'88 OTB).Suitable for framing. $45 ea. Limited quantities. J.J. Papovich, 53 Magnolia Ave., Pitman, NJ 08071 (609) 582-8279

--Central Electronics 100-V and Central Electronics 600-L. Both working.Extra tubes and original manuals. Also have Hammarlund Model SP-600 for trade. O.L. Potter, 498 Brightwaters Dr., Cocoa Beach, FL 32931

--NOS bakelite knobs, 1" dia. (brown) w/set screw. $2. ea.;New .001/12kv tv capacitors 2 9/16" x 5/16" $2. ea.; WE 264C $7.50;new Sprague tubular 20 uf/600v 2½" x 5/8" $3. ea. Will have tubes at Radio Daze meet May 19, 20. SASE with needs. Jim Farago, Box 6313, Minneapolis, MN 55406

--RCA Model V by GE w/o tubes,missing coils and grid leak and no cabinet.$40. Also AK 20C excellent $50. Ken Johnston, W7LIX, 7521 York Road,Helena, MT 59601 Tel (406) 475-3768

--power transformers, Stancor PC 8402 for early AC sets. 240-0-240v, 55ma; 5v,2A; 6.3v,2A like new $15. Phil Goodman, 20341 NE 30th Ave., Miami, FL 33180 Tel. (305) 931-7189

--Marconi/Osram 50w. xmtr tubes,type AT50, c. 1923 $25. ea.; VT25 post office repeater tubes (tipless) pg.368 of Saga. $10. ea.;also have VT39 and VT40.Autographed copies of "History of Philips Radio Tubes 1917-1935" $8. Want 2x250 turn honeycomb coils and RCA UL1008 oscillation xfmr and green glass shade for emeralite #8734 desk lamp. Fin Stewart, P.O. Box 1211, South Gosford, N.S.W. 2250 Australia

--68 year collection-Radio Masters catalogs, manuals,flyers,books, old televisions,radios,phonos,ham equip., military gear. 48 page list $1. refundable. F. Yonker, 7 Old Farms Rd., Saddle River, NJ 07458

--Philco 1201 (1948) AM radio w/concealed phono,radio works,phono untested. Needs to have idler reinstalled,excellent. $55 see FOS pg. 136. Truetone Series 7J square top with Shortwave untested (needs power cord) v.g.$85. Also other radios,books & tubes. Send 2 stamps for complete listing. Ron Boucher, P.O. Box 541,Goffstown,NH 03045 Tel. (603) 497-2988

--Acme .0005 mf condenser with celluloid cover.Very good condition.Make offer with SASE. Dick Randell, K6ARE, 1263 Lakehurst Rd.,Livermore,CA 94550

DISPOSE/TRADE

--A-K10,Philco 90,Hopalong Cassidy, Coca-Cola cooler,Air King 222 & 511A, Pittsburgh SP2, Holtzer-Cabot horn, piano radio,cathedrals. Want Ozarka cathedrals, Erla 22P and Amplion AR19. Gary Hill, 1507 Ridge Ave., New Castle, PA 16101

--radio related tie clasps & lapel pins, send a LSASE. I also buy old wooden clocks. Michael S. Sabodish Sr., 11-A Matawan Ave., Cliffwood, NJ 07721

--cathedrals: A-K 92,Philco 90,Philco 60/50S,Crosley No. 125.Also Philco 40-125,Philco 38-12,Philco 38-12,Philco 48-200,Motorola 67X13,Zenith K725,RCA 128,Westinghouse headset 528BW,Partiot Junior (case only). Ross Litrenta, 1 Wilton Road, Eastchester, NY 10709

--complete set of Popular Electronics magazines 1955-79. Will break by year. Also QST in binders (except 55,59). Mike Grimes, K5MLG, 3805 Appomattox, Plano, TX 75023

--Radiola V with FH hornspeaker $200. Western Electric WWI chest microphone (model 340W) for airplane set $50. Philip Drexler, 1175 E. Ripley Ave., St. Paul, MN 55109

--Crosley Ace $100.,Mission Bell receiver $65.,Thompson Neutrodyne $110.,

DISPOSE/TRADE

AC Dayton XL20-6 $145. Want cabinet for my SCR 54,known as Box BC14 and WWII spy radio built in a suitcase (rec. & xmtr.) David McKenzie, 516 South Exeter St.,Eustis,FL 32726 Tel. (904) 589-0149

--Riders,Howard Sams,tubes,test equip., parts,more. Send SASE for list. Krantz, 100 Osage Ave., Somerdale, NJ 08083

--18 Supreme Radio Manuals; #1 (1926-1938) and one per year 1950-1966.Make offer. Want old variocoupler similar to Radiola III type and spider web coil like one in Crosley 51. Would like answers within 200 miles. William Pierpont, 2814 N. Fountain, Wichita, KS 67220

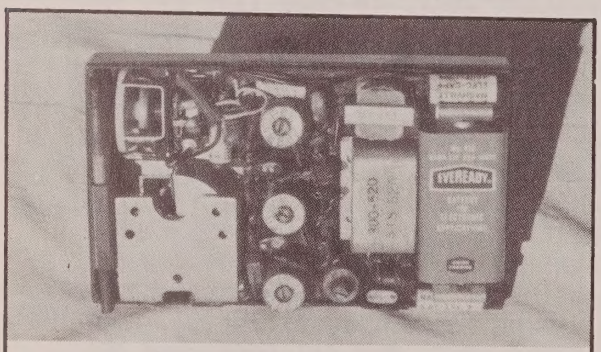
--key-Theodore R. McElroy 'Deluxe Model Mac key' SN.#365 in very good condition. National NC 303, needs some work, w/manual and 2 meter converter. Tony Musero, K3UKW, 1609 So. Iseminger St., Philadelphia, PA 19148 (215) 271-8898

--WD-11 replacements; NOS WE 215-A (VT-5) on WD-11 base, electrically the same as WD-11. $15. plus $1. postage. Want Radiola RS,Radiola I, VI and Clapp-Eastham HZ amplifier. Charles Rhodes, 64 South River Rd., Edgewater, MD 21037 Tel. (301) 266-3691

Transistor

(Continued from p. 18)

I. D. E. A.), two neutralized IF stages, a diode detector, and a single transistor in the output circuit. The IFs operate at the low frequency of 262 kHz to get adequate gain from the 1954-vintage transistors. The second IF stage receives its bias current from the audio output stage, another I.



Inside view of the 250.

D. E. A. patent. The receivers are powered by 22-1/2 volt batteries and use 15-ohm, 2-3/4 inch speakers. Power output is 12 mW at 6% distortion. The transistors are early Texas Instruments types, unusual because they are NPN types.

The HDTV standard is a joint effort of Japanese interests and the SMPTE. It is being advocated as a new international TV standard. There are several other standards for high- or extended-definition television which are being developed. The most significant of these is called ACTV, advanced compatible television. This standard is designed to provide usable signals to existing TV receivers and at the same time bring improved picture quality using newly designed receivers. It is possible that both standards will be adopted, with the 1125/ 60 being used for original picture generation with conversion to other systems and ACTV being used for transmission to existing 525/60 NTSC sets. It will be very interesting to follow developments in this field. [BK]

-OTB-

NEW MEMBERS

The names of all new members will be listed routinely in the OTB. If your name has not appeared within six months, write to the Editor. If you DO NOT wish to have your name published, please notify the membership secretary. Please note that the AWA does not publish or otherwise supply a mailing list of its members.

Ed L. **Adrian**, LA
Edward D. **Allen**, MI
Charles L. **Anderson**, NY
David L. **Anderson**, N0ALN, KS
O. T. **Anderson**, W5IWL, OK
Henry L. **Ankeny**, W0FSY, IA, radio engineering
Mark **Apterman**, Australia
John **Babina**, Jr., WA1OOT, CT, WMNR
Peter **Backus**, VA
Travis **Bailey**, K5AVH, TX
John C. **Baldwin**, HI
Rick **Barnes**, VA
Norman **Basden**, NC
Kenneth **Bauer**, W9WGQ, IL
Daniel C. **Baum**, WB8YUG, WV
Harlow **Beene**, W5ZSL, NM
Jerry S. **Berg**, MA, CPRV
Dan E. **Berry**, W3UAT, NY
Gregory **Bingham**, KY
Roy A. **Bloom**, KHO 0135, MO
Gerald **Boles**, N5KYE, OK
Paul L. **Bongiovanni**, MA
Greg **Bouffard**, CA
Tom **Boyle**, WA2FHV, NY
Darin **Bradley**, MN
L. Warren **Brandt**, AL
John J. **Breen**, CT
Mike **Brophey**, N2DBY, NJ, WXTU
William T. **Bross**, WA8KBA, OH
Raymond L. **Brown**, MC
Richard S. **Buchholz**, W4JNE, FL
Laurence **Bultman**, IL
Richard **Caley**, NY, Engineer, Sloan-Kettering Cancer Center
Donald A. **Campanelli**, WB2ABK, NY, RF Comm.
Clifford **Campen**, W3LVC, MD
Joseph **Caporale**, VT, WA1EDI
Al **Casamassima**, NY
Haralambe **Chiosa**, NY, Rome Air Development Center
Bruce A. **Clark**, NY
James M. **Cole**, VA, K4HRO
Lorenzo **Conzatti**, Germany
Dan **Craig**, WK7E, WA
William **Crawford**, KS
Paul **Currio**, FL
Wolfgang **Daum**, NY, DF2IF/W2, EE, General Electric
Lawrence S. **De Rose**, NJ, aerospace engineer
Craig **Dible**, KB6LAK, CA
Carlisle L. **Dieter**, MA, Naval Research Laboratory
Prof. Alfonso **Dominguez** C., Mexico
David **Donicki**, ex-WB8TPJ, MC
Peter J. **Dugal**, NJ, Bell Communications Research
David **Edwards**, VA
Kenneth Allen **Ellis**, NC
Marc **Ellis**, N9EWJ, IL, Popular Electronics
Dennis W. **Elmore**, NY
Randy **English**, NY, WGY and WTRY
Louis W. **Erath**, WB5M, LA, radio-electronics engineer
Carlos A. **Esteva**, TX
Michael W. **Farnsworth**, MD
Robert G. **Farricy**, K2QZ, NY, Municipal FD
Harvey E. **Faulkner**, DE
Thomas J. **Flood**, WA2BCC, NY
James **Fong**, DPM, CA
Glen A. **Fritz**, DDS, FL
Mike **Fukuda**, NJ
R. D. **Galloway**, FL, 2-way radio
Tom **Gambill**, CA, Fourier Components
T. Harry **Gatton**, NC
Glenn R. **Geist**, IL
Len **Geraldi**, K6ANP, NJ, Bell Communications Research
Gerard L. **Granat**, NY, Philmore Mfg. Co.
Richard R. **Grelle**, KA1OCZ, CT
Larry **Guenther**, W4WT, VA
George H. **Gunnoe**, K3DA, PA
Al **Guy**, KB6J, CA, radio repair 1946-52
Frank **Guyer**, W2VSV, NC
Gary H. **Hackworth**, VA
James Edgar **Hall**, Sr., NC
Richard **Hanelin**, LA, Richard's Radios
Wayne **Heisl**, MN
John C. **Herkimer**, NY, CPRV
Leslie G. **Herman**, NY
Richard **Hook**, NE
Kent A. **Ise**, RI
Adrian **Jeffries**, NJ
Robert B. **Journell**, VA
Thomas E. **Jurgens**, KY8I, MI
Arthur M. **Kahn**, W6NJY, CA
Bernard R. **Katz**, K2LNL, NJ, design consultation
Michael J. **Keretzman**, NY
Stephen **Kerman**, CA, WOR-TV
George R. **King**, N4UCX, VA
Steenar Y. **Knudsen**, Norway
Kenneth G. **Kott**, WK8F, MC
Don **Kresge**, AL
Richard A. **Kronholm**, NY
Earl W. **Landry**, TX
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Pasquale **Lombardi**, NJ
Alan J. **Long**, OH, AJ's Radio & Electronics
Joseph L. **Mader**, ND, commercial sound
Lou **Maggio**, NY
Frank P. **Maggiore**, N3FGN, PA, Maggiore Electronics Lab.
Marion **Maginnis**, CA, US Navy, service shop
Charles **Martin**, FL
Ronald L. **Maseda**, PA
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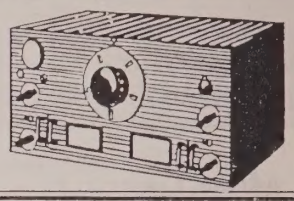
Douglas O. **Mottern**, KA1CWU, GA
Paul G. **Motznik**, PA, Western Electric, mobile radio repair
Les **Myers**, NY, 1-kW AM stn.
Ernest L. **Nagy**, MC
James **Nicholls**, CA
John P. **O'Brien**, W2KFG, PA
Michael **O'Brien**, KS
John L. **Orahood**, TX

(Continued on p. 46)

THE COMMUNICATION RECEIVER



EDITED BY
WILLIAM FIZETTE, K3ZJW
RD #1 Box 55, Henryville, PA 18332
All correspondence requires SASE for reply

FIRST "MODERN" COMMERCIAL SW RECEIVER: THE AR-1496

Bruce Kelley, W2ICE

By the mid-Twenties, commercial interests realized that long-distance communication was more effective with low-power shortwave than with high-power longwave transmitters. This brought changes in both transmitter and receiver design. Most notable for commercial receivers was the introduction of the UX-222 screen-grid tube in 1927. The tube made it possible to have a high-gain and relatively selective tuned radio-frequency stage, which was impractical with triodes.

The result was the first "modern-design" shortwave receiver: the AR-1492 (and modified version AR-1496). It was made by General Electric for RCA in 1927 for ship-to-shore and commercial use. Production was limited and few were saved. To my knowledge, there is but one other than the set in the AWA Museum.

Two of these receivers were used at the GE 1927 shortwave station for regular reception from G5SW (Chelmsford, England), VK2ME (Sidney, Australia) and PCJJ (Eindhoven, Holland).

The receiver uses a UX-222 TRF, UX-240 regenerative detector, and two stages of audio with UX-201As. The metal cabinet is 27 inches in length with shields dividing it into three compartments. The first compartment (at left) houses a swinging antenna coil, which is coupled to the grid circuit of the RF stage through an electrostatic shield.

The second compartment contains the tuned RF stage with the UX-222 tube, which in turn is coupled to the regenerative detector in the third compartment. Cardwell condensers with plates of varying thickness provide improved bandspread at the higher frequencies. Three pairs of plug-in coils enabled the commercial operator to tune from 12 to 80 meters. The set is designed for quiet battery operation. Reference to the schematic diagram shows careful attention to RF filtering of all battery and audio leads leaving the cabinet.

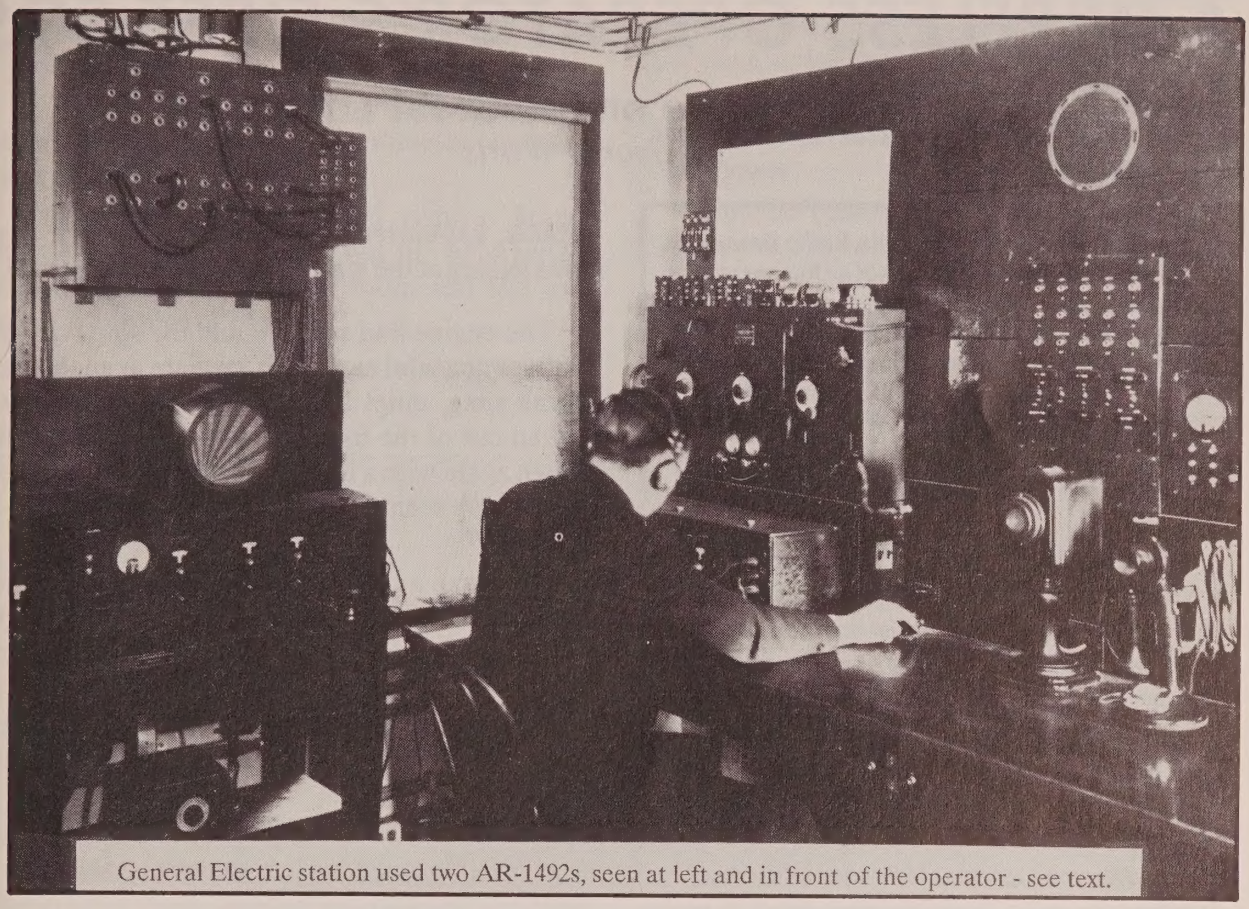
The associated photo shows the General Electric Co. Sacandaga receiving station (NW of Schenectady) from which regularly scheduled communications were conducted with 5SW, Chelmsford, England; 2ME, Sydney, Australia; 6XN, the GE station at Oakland, CA; PCJJ, Eindhoven, Holland; etc. Equipment shown left to right: small wavemeter; receiver, AR-1492D; loudspeaker, Model 103. Large box in front of operator is a 3-stage RF amplifier. Another AR-1492 in front of operator. Condenser microphone at right. Note the dial candlestick telephone on a scissors arm (an unusual combination). Albert B. Hitt, operator.

John Drake with AR-1496.

The receiver was acquired from John Drake, was restored by Assistant Curator Steve Sykes, and is currently housed in the AWA Annex. More information can be found on pp. 448-453 of George Sterling's Radio Manual (2nd. ed., 1928). I would like to correspond with others who may have one of these elusive sets.

(Continued on p. 37)

(Continued from p. 36)

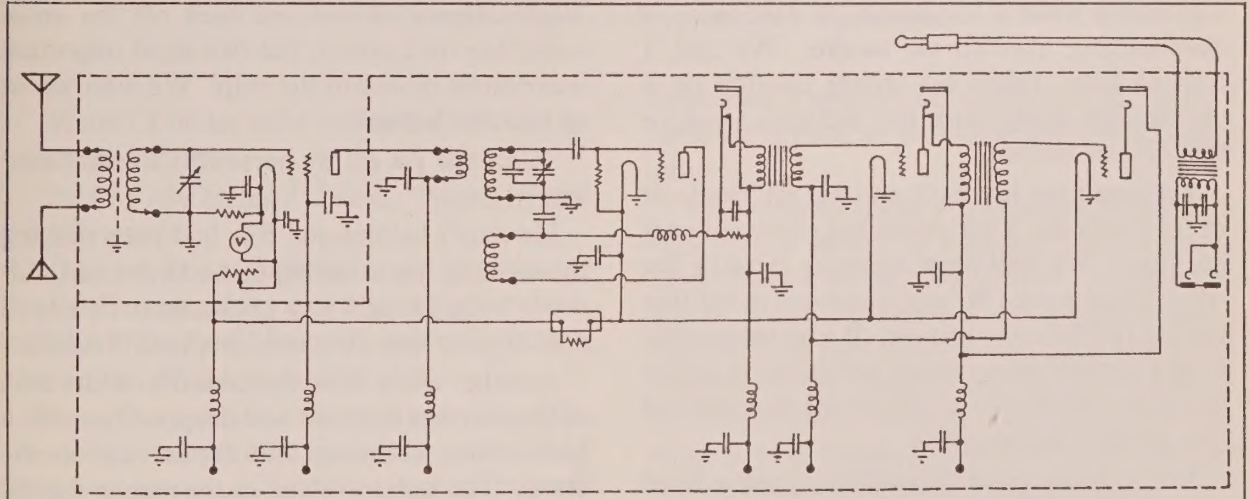


General Electric station used two AR-1492s, seen at left and in front of the operator - see text.

Nameplate -

AR-1496-D

(Continued on p. 45)



Schematic Diagram, Modified Model AR-1496 Short Wave Receiver

A WIRELESS OPERATOR'S FIRST SOS

An adventure on the Great Lakes

by George Worts

This amusing story appeared in *Radio Broadcast* 60 years ago. It tells the story of a ship operator's first SOS on one of the many passenger vessels plying the Great Lakes. The time: just before WWI. It is interesting to note he was using an United Wireless receiver, equipment taken over by the American Marconi Wireless Telegraph Company. *– Ed.*

There was nothing in the least amusing about it when it was happening. We were soberly and solemnly aware that the most dramatic situation that can arise in the life of a ship confronted us. The *North American* was fast aground and lost in a heavy fog. Five hundred passengers, mostly women and children, were endangered. Responsibility for all these lives had been suddenly dropped upon our shoulders. A heavy swell – the aftermath of a gale – was lifting us and dropping us with great thumps upon a rocky shoal somewhere in the Strait of Mackinac; and the ship was canting dismayingly to starboard.

It was a tremendous moment. I had been "*pounding brass*" for two years, and here at last was the opportunity for which I had been secretly and shamefully hoping – the opportunity, I suspect, for which every youthful wireless operator secretly and shamefully hopes – of sitting down at the key and rapping out the three most electrifying letters in the alphabet – S O S!

I had retired to my stateroom a little after six o'clock from the midnight-to-six watch, and was asleep when it happened. A sudden jar, a deepbanging, startled me awake. We had, I learned later, taken the wrong bearing on a certain light during the night, and were a mile or two off our course.

I sprang from my bunk and put my head out of the porthole. Cold white fog streamed past my face. We had been creeping through fog when I had turned in, and it seemed to me that the fog had become thicker. It was impossible to see farther than twenty portholes in either direction and the white hull above me vanished into creamy nothingness.

From every porthole within range a head protruded, nose down. Some were men's heads and some were women's heads adorned with braids, kid-curlers and lace caps. Every one was gazing at the water, and no one said a word.

The engine had stopped and the ship was as still, as peaceful as though we were at anchor in some snug, quiet harbor. Then a long wave rolled out of the fog and lifted us. We settled down again with a harsh scraping sound and the whole ship seemed to shiver as we listed to starboard.

A woman at a porthole above me said, in an amazed voice, "Why! we're aground!" She did not seem alarmed. In fact, no one seemed alarmed. That, to me, was astonishing. I had heard that in moments such as this every one became panic-stricken. The excitement came later.

We all stared with fascination at the water. It was pale blue and so clear that we could easily see the stones on the bottom. They were of all sizes, some as small as golf-balls, some as large as basket-balls.

My stateroom door opened and Kenneth Little, the junior operator, burst in with a white face and excited eyes. He was grinning nervously.

"Well!" he got out breathlessly. "We're on!"

We exchanged glances with which every wireless operator can sympathize. Our great moment had come! No longer were we the playthings of passengers – luxuries forced upon unappreciative owners. We were, provided the *North American* did not back off the shoal under her own power, the two most important individuals on board the ship! We were about to become heroes!

"Can she get off by herself?" I asked anxiously.

He didn't believe so. She had been running through the fog at half-speed and she had suddenly been brought to a jolting stop. It wasn't conceivable that she could back off that ledge.

Another wave lifted the beautiful white bulk of the *North American* and dropped her with a harsh deep booming still farther up on the shoal. The hull trembled as the engine started full speed in reverse. A glance from the porthole assured me that steam was being wasted.

The golf-balls and the basket-balls remained stationary while bubbles from the propeller swept forward.

I had always pictured myself, when this moment came, as a man of coolness, courage, and decision.

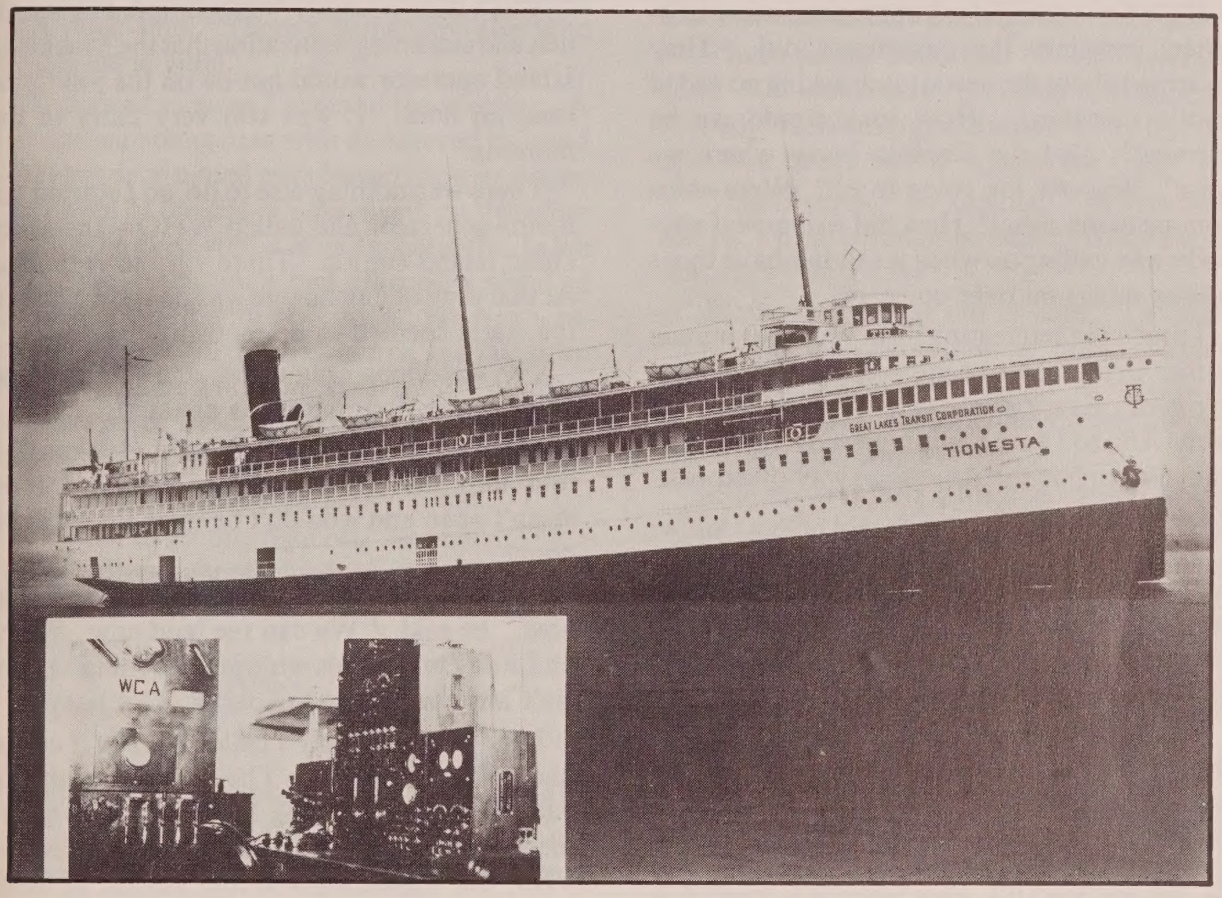
"Get back on the job," I said crisply. "Stand by and wait for me. Test out the emergency outfit. Call up the engine-room and tell 'em we'll want plenty of juice."

at a moment's notice. He told me rudely to keep my shirt on and not to send an S O S without the Captain's explicit orders.

I asked him if there seemed to be much chance of our backing off the shoal under our own power.

"How do I know?" he said irritably. "Stay where you are and don't go fooling around the decks. We may need you."

It appeared that, in the opinion at least of the



The Tionesta - a typical Great Lakes vessel of a bygone era.

"Hadn't I better send out an S O S?" he inquired hopefully.

"Not by any means," I said. "Stand by and wait for me."

"Stand by" is a phrase that has always appealed to me, along with other nautical terms such as "Steady as you go," and "Bright light two points off the port bow, sir!"

When I entered the wireless room the telephone from the pilot house commenced to ring. The first mate nervously wanted to know if everything was all right with us. I reported that we were standing by and ready to send an S O S

first mate, I was not yet the man of the hour. I devoted myself to an inspection of the apparatus.

The wireless room was situated in the starboard after corner of a square hall between-decks known as the "*social hall*". At one corner of the social hall was the purser's office. Across from that was the steward's office. In another corner was the baggage room; and in the fourth corner was the large glass and mahogany cage housing the radio apparatus and the newsstand. We ran the newsstand – sold magazines, candies and cigars – in addition to operating the wireless.

A WIRELESS OPERATOR'S FIRST SOS

continued

Our transmitter was a 2 k. w., 240-cycle rotary synchronous set – the first of its kind to be installed on the Great Lakes, and a source of endless trouble. Our receiving set was a heritage from United Wireless days, a loose-coupled tuner and a carborundum crystal detector in which we defiantly used silicon and a cat-whisker of mandolin E-string. The audion had yet to cast its pale glow upon radio scenery.

If the first mate did not appreciate our importance, certainly the passengers did. They swarmed about the newsstand, asking no end of idiotic questions. How long would we be aground? Did the Captain know where we were? Was the fog going to lift? Were ships coming to our relief? How did we know if anybody was calling us when we didn't have those rubber things on over our ears?

I made the interesting discovery that human beings in moments of great crisis crave chewing-gum. Every one wanted to buy chewing-gum. And so I have come to the conclusion that gum chewing is the American way of expressing deep emotion.

We closed the newsstand emphatically. Somehow, selling chewing-gum to anxious passengers did not harmonize with the dignity of our position. We were wireless heroes, not chewing-gum salesmen!

The long waves continued to roll up under the stern from out of the fog, driving the ship farther and farther upon the ledge and tilting us more and more to starboard. The pounding did not excite the passengers, but the listing did. The opinion prevailed that the *North American* was about to turn turtle.

Within half an hour after the first impact, many of the passengers put on life-belts. The social hall was in a hubbub. Every one was asking every one else questions.

The second assistant engineer covered with mud and rust raced through the social hall and demanded the use of our telephone to the pilot house. He had been down in the bilges and wanted to inform the Old Man that no visible damage had been suffered by the garboard strakes.

"She isn't taking any water, but we're stuck tight," he reported excitedly.

The first mate asked for me.

"The Captain wants you to get hold of Mackinac Island and have a tug sent out."

"Yes, sir!" I snapped. "Where are we?"

They didn't, it developed, know exactly where we were.

"On one of the Duck's," he guessed. "Tell the tug to nose around the Ducks. We're probably on Little Duck."

"Yes, sir!" I snapped. A picture came into my mind of the Old Man and I in the act of leaving the ship – sticking to our posts to the very last, while the ship was ground to flinders on one of the Ducks.

This vision possibly was prompted by a sudden and sickening realization that the Mackinac Island operator would not be on the job for at least an hour. It was still very early in the morning.

There was nothing else to do, so I started the motor-generator and called WHQ – the Mackinac Island station. There was no response. At that time of day no one was on the air. Even the static seemed to be reposing.

The telephone rang again, and this time the voice of the first mate was agitated.

"Has that tug started?" he wanted to know. I told him that the Mackinac Island station wasn't open and wouldn't be open for another hour.

"You've got to get word to Mackinac somehow," he said. "We can see land now. We're on Little Duck. This wind is freshening. There isn't any time to lose, Sparks. Get busy!"

I got busy. Futilely I called WHQ. I called and called and called. The operator probably hadn't left his boarding house. It was a tormenting situation. In desperation I called VBB, the Canadian Marconi station at Sault Ste. Marie. Someone was always on duty in VBB. He could put the message on the land line to Mackinac Island. Then I realized with a sensation of sickness that the Western Union office at Mackinac Island did not open until WHQ opened.

VBB did not answer. I called him feverishly for five minutes. Then I rang the pilot house. The Captain answered. I told him that I had tried to raise Mackinac Island and the Soo, but that no one answered.

"See if there isn't some ship near us," he replied.

"That means an S O S," I told him.

"All right – send as S O S!" he snapped. "But get somebody. What are you fellows being paid for?"

And so the great moment came, not precisely as I had wished, perhaps; but here, at all events, it was. After two years of faithful brass pounding I was about to send my first S O S! I was divided between perspiring agitation and a consciousness of the part I played in this epic maritime drama.

Kenneth, the junior operator, looked at me enviously as I slipped into the chair and grasped the handle of the motor-generator starter.

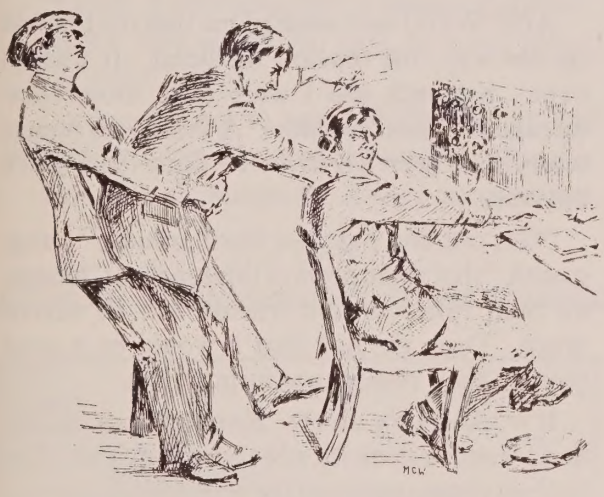
"S O S", he gasped.

"Yes," I said fatefully. "It's S O S! Keep that door shut! There's somebody else who wants some gum!"

It opened even as I shouted the warning. A perspiring young man with disheleved hair and wild but determined eyes forced his way inside. The eyes of dozens of passengers on the other side of the glass stared at us expectantly. In his hand the young man had clasped a sheaf of papers covered with pencilling. He was a reporter on the *Chicago Examiner*, and this story was, of course, a big one. Nearly all of our passengers were Chicago people. It was a front-page story, worthy of a seven-column streamer.

He shoved the pile of paper at me.

"I want to get this right off," he panted. "It's press. It has right of way over all traffic. It's to be sent collect."



"I AM IN THE MIDST OF SENDING AN S.O.S. HOW DARE YOU BREAK IN HERE!"

He produced documentary and other evidence to support the statement that he actually was a reporter. Sweat was streaming down his face, and sweat was streaming down mine. I was trying to push him out of the room. He was trying to push me into my chair. We weren't making much progress.

"Look here," I said dramatically. 'I am in the midst of sending an S O S. How dare you break in here!"

"The devil you are!" he cried. He snatched the paper from my hands and wrote rapidly on the top sheet: "Radio men sending frantic calls for help!" I glanced bewilderedly over his shoulder at other things he had written. The *North American*, I learned, was slowly being pounded to fragments by a savage sea on the gleaming fangs of a rockbound coast. Women and children were running screaming about the decks. The ship's officers were determinedly setting them an example of coolness and courage. The lifeboats were in readiness. A furious gale was blowing up. The lives of five hundred Chicagoans were in acute peril.

"That's bunk," I snorted. "I won't send that stuff. We aren't being pounded to fragments. Nobody's screaming, and a gale is not blowing up. You better let the skipper see that.

"This is press," he shouted. "If you don't send it, I'll have you prosecuted! There's a law that says – that says – –."

"If you don't clear out of here," I stopped him, "I'll have you put in irons. You're interfering with the despatch of a distress signal." I appealed desperately to my partner. "Ken, get him out, will you?"

Kenneth grappled with our natural enemy while I sidled into the chair and started the generator. The reporter broke away from Kenneth and shoved his one-act melodrama beside my sending arm. My hand was already at the key.

"Won't you *please* get it off when you're through with that S O S?" he begged, and there were tears in his eyes.

"I'll have to edit it first," I said angrily.

"If you touch a line of that copy," he shrieked, "I'll have you jugged the minute we hit Chicago! I'll break you! I'll beat you up! I'll have your license taken away! I'll – –"

Kenneth pushed him out into the crowd in the social hall, and he was shaking with sobs. I could have brained him. He had cheapened my grand dramatic moment and set every nerve to jumping.

My fingers danced on the key.

"*Z Q P! – S O B! – F O S!*" the spark stammered. Then I steadied my hand and ripped off a string of very creditable S O S's.

I threw over the aerial switch to the receiving position. The mournful lazy drawl of a big ore freighter came instantly out of the fog. The name of the ship is forgotten.

"Where are you O M?" I have always disliked operators who use that solicitous and ingratiating phrase O. M. – "*old man.*" "Are

you sinking, O. M.? You come in good and loud, O. M. Stick to the ship, O. M."

I coldly informed him that our danger was not yet acute, that we were aground on Little Duck Island and wanted to have some one tow us off.

He replied with a series of irritable "9's". That meant, in those days, "I am being interfered with." I wondered who could be jamming us, and while I wondered the smooth buzz of VBB, the Soo, enlightened me.

"What is your position?" he asked. "Are you in immediate danger?"

I told him to stand by, that he was jamming me, and called the ore boat. VBB came back, insisting on having my positon, and a report on the character of our predicament. He additionally wanted to know why I had sent an S O S without first calling him. My nerves were on edge from that tiff with the reporter, and I told him sarcastically that it was a real nice day and I hoped he had enjoyed his smoke. I used profanity freely.

He informed me that the use of profanity was strictly forbidden on aerial circuits and was punishable by a fine and a long term of imprisonment under section 112-A or 233-B or 40-11-X of the International Radio Regulations.

"You should be ashamed of yourself to use such language in a situation as grave as this." Presumably he meant that my chances of getting into Heaven were imperiled. He finished his sermon, and I again addressed my invisible friend on the freighter. Where were they? He reported that they were just rounding McGuipin Point, northbound, which meant that it would take them hours to reach us. That hope was too dim.

I resorted to a few more S O S calls, mingling the distress signals with calls of WHQ, and, when I signed off. WHQ's rasping spark answered. In all of my years of operating, I have never been so relieved to hear a spark.

Complications immediately ensued. The operator at WHQ (there was but one) was then very new to the game. I am glad to say that he later became an expert operator.

His reply to my S O S was bewildering. After wishing me a courteous good morning and making inquiries touching upon the state of my health, he sent me all of the baseball scores for the previous day. He then proceeded to furnish me with long selections from the overnight news. He was not absolutely to blame. For time-saving purposes, we had abbreviated the request for ball scores to the three letters S B S – send ball scores. The similarity between S B S and S O S is noteworthy. Perhaps he was sleepy that morning.

When he was through regaling me with the topics of the day, I slowly and patiently informed him that it was succor and not base ball scores that I had asked for. Here we were, piled up on the rocks, every moment precious, and he was using perfectly good electricity to tell me that Charlie Chaplin had just signed a contract for $1,000 a week. Good God!

For several seconds there was not intelligible response from him – only the stuttering of his spark as his paralyzed hand tried vainly to work the key. In broken Continental he presently told me to stand by a moment while he telephoned the waterfront for a tug.

And so my heroic moment came, was lived, and passed. I telephoned the Captain that a tug was on the way. I read the stirring one-act melodrama with its cast of five hundred screaming women and children supported by the ship's officers who set their cool and courageous example. I tore it up and dropped it into the wastebasket. We were on a popular run; and that story, had it been published in Chicago, would have ruined our passenger business for the rest of the season. The reporter threatened me with sundry revenges, none of which I suffered.

After WHQ had assured me that the tug was on her way, the tension subsided. It was all over. Kenneth and I were once more commercial wireless operators. A wonderful opportunity had been given us to do a land office business.

"Get out and pass the word around," I suggested, "that when news of this reaches Chicago, all their relatives and friends will be scared green. Drop the hint that it would be a good plan to send radios reassuring them."

It worked very nicely. Kenneth took charge and I went on deck for a breath of fresh air. The fog had evaporated and the warm Michigan sun beat brightly down upon sparkling blue water – and a little island covered with evergreens a few hundred yards ahead. The news had travelled magically over the ship that a tug was on the way from Mackinac Island and that there was nothing now to worry about.

I was proud of myself. Very few wireless operators had gone through this ordeal. I had sent my S O S – a very authentic and dramatic S O S – and was one of that noble company

"LOOK! THERE GOES THAT WIRELESS OPERATOR!"

captained by Jack Binns. I glanced up affectionately at the smoke-blackened four-strand antenna and heard a man exclaim:

"Look! There goes that wireless operator!"

And a very pretty girl said, in awed tones, "Gee whiz!"

I pretended not to hear. With head up and shoulders back, I proceeded on my way.

Don't be uncharitable. *I was only nineteen.*

The End.

Pete Stewart
Canadian Great Lakes Shore Station, Midland, 1914

UNCLE SAM TO CERTIFY WIRELESS OPERTORS

May 13, 1912

WASHINGTON, May 13.—To bring about greater efficiency of wireless operators on ocean going vessels the Department of Commerce and Labor will issue a certificate of skill in radio communication to operators who pass examinations which are to be held at many of the United States navy yards within a week or two. To secure a certificate an operator must qualify in the adjustment of apparatus, correction of faults, change from one wave length to another; transmission and sound-reading at a speed of not less than 15 words a minute, American Morse and 12 words Continental.

-OTB-

RECENT RADIO and ENTERTAINER OBITUARIES

by Charles Griffen

Hal Ashby, 59, movie director for "Harold and Maude," "Shampoo," etc.
Frederick T. Bowditch, battery-radio developer for National Carbon Co.
Thorton Bradshaw, 71, last chairman of RCA.
Leon Bush, 65, chief engineer WPBN, WTOM.
Serge Canivenc, F8SH, French authority on radio propagation.
John Carradine, 82, stage and movie star.
Sidney Carroll, 75, film/TV writer including "The Hustler."
Samuel Carter, 84, writer of the "Lux Radio Theater," "Philco Show," etc.
Morton Da Costa, 74, director of shows "Auntie Mame," "Music Man," etc.
Aldo de Demonicis, 85, owner of WTNH, WELI, WNCH, WRCQ, WRCH.
William W. Eitel, W6UF, 81, co-founder of Eitel-McCullough.
Ron Field, 55, choreographer for Fred Astaire, Gene Kelly, Ray Bolger.
Pegeen Fitzgerald, 80s, lifetime broadcaster on WOR and WNYC.
Russell Furse, 80, ABC and NBC executive.
Erwin Gelsey, 88, screenwriter for "Big Broadcast of 1937," "Swingtime," etc.
Sheilah Graham, 84, gossip columnist and F. Scott Fitzgerald's mistress.
Alan Gundelfinger, 88, pioneer in producing color movies.
Louis Hausman, 82, former VP of CBS and NBC.
Eddie Heywood, 73, pianist-arranger who popularized "Begin the Beguine," etc.
Julius Hirmann, K2ABB, 95, RCA tube pioneer and holder of 600 patents.
Peggy Johnstone, 87, actress in original "No, No, Nanette" and "Oh Kay."
Henry Krueger, 70, veteran of the Second Mobile Broadcasting Company attached to General Patton's Third Army in Europe.
Walter Laidlaw, 81, pioneer broadcaster at KPIX and KFBK.
Robert Lembke, 75, West German TV quizmaster of 337 broadcasts.
Edward Le Veque, 92, last survivor of original "Keystone Kops."
Beatrice Lillie, 94, popular musical comedy star.
John Loder, 90, movie actor.
Samuel Lovett, 94, jazz drummer with Count Basie, etc.
Marian Mansfield, 83, movie and radio vocalist.
Rev. **V. Vernon McGee**, 84, pioneer radio evangelist.
Herbert Morrison, 83, radio announcer at the Hindenburg Zeppelin disaster of 1937.
Jess Oppenheimer, 77, creator of TV show "I Love Lucy."
Bob Osborne, 57, staff member KMOX.
Frank Palik, FCC division head.
Joseph Raposo, 51, director of TV show "Sesame Street."
Joseph Ridder, 68, of Knight-Ridder television station chain.
Max Robinson, 49, TV network anchorman.
J. Maxim Ryder, 89, former manager of WBRY and WQUA.
Guido Sacerdote, 68, pioneer Italian television programmer.
Charles Sammons, 90, founder/chairman of Sammons TV Cable Co.
Anne Seymour, 79, veteran theater, radio and TV star.
Bob Steele, 82, cowboy in 400 films.
Jan Stillbach, 77, chairman of LaPointe antenna industries.
Roy Tash, 90, pioneer Canadian news cameraman.
Lance Thirkell, 67, manager BBC.
Billy Tipton, 74, jazz saxophonist; played with Jack Teagarden, etc.
George Turner, K4AP, retired chief, FCC engineering and monitoring division.
Don Voorhees, 85, led "Bell Telephone Hour."
Al Williams, 59, news director at WILD and WNEV.

-OTB-

CATALOG OF PARTS AND KITS

There's a new catalog out with a variety of parts for constructing receivers, plus complete kits for three types of table radio, three crystal sets, a 6L6 amateur CW transmitter, a couple of small stereo amplifiers, etc. Most of the kits use gaseous-state field-effect technology, i. e., tubes. To get a copy:

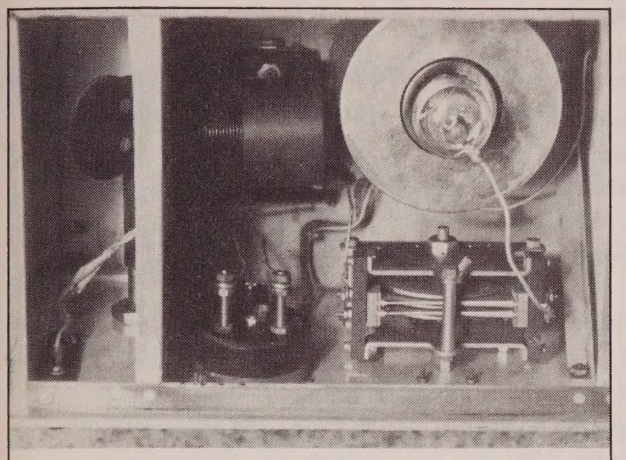
Yeary Communications
12922 Harbor Blvd. #800
Garden Grove, CA 92640

Book Review (Continued from p. 26)

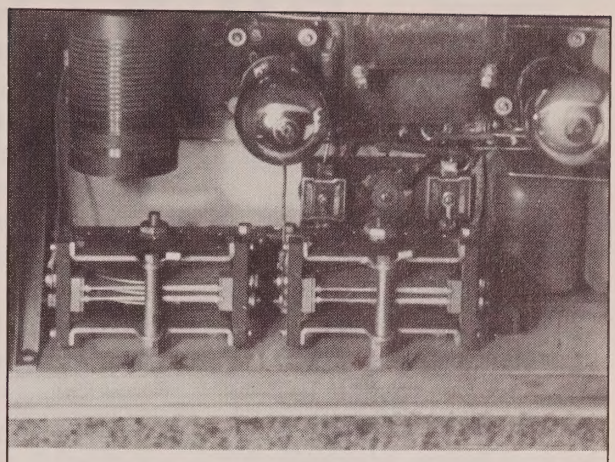
Coverage is best for German makers, not surprisingly, followed by other European and by British companies, with a few tidbits on American tubes. Some 1940s and even 1950s data have also sneaked in, largely lists of WW II equivalent tubes. A chart of Telefunken's two-letter 1930-68 date coding is also included.

Soft cover, 192 pages, available for $15.95 from Antique Electronic Supply, 688 W. First St., Tempe, AZ 85281, 602-894-9503.

 (Continued from p. 37)



The TRF stage with variable coupling coil at left.



Detector and audio stages. Regeneration is controlled by variable capacitor.

BRAZILIAN RADIO EXHIBITION

This is now a matter of history, but of interest nonetheless. We are advised by AWA member Carlos Fazano that an exhibition took place in Sao Paulo, Brazil, last December 14-30. Prepared by another AWA member, Edison de Freitas, and held at the Sadalla art gallery, it featured a goodly number of antique European and American radios. Radio collecting seems to be flourishing everywhere. [LAS]

AM PHONE QSO PARTY?

The perennial interest in operation of early CW transmitters has brought queries: how about early phone? To do this and have an annual AM Phone QSO Party, there will be a need to determine interest and develop guidelines. Here are some suggestions: (1) have two classifications, (a) 1931 or earlier transmitters using Heising modulation and 10 watts or less input, (b) 1932-39 transmitters with Class B modulation and power less than 50 watts; (2) use only prewar receivers; (3) operate on the 75-meter band.

If you are interested in demonstrating this early type of transmission, write and let me know: Bruce Kelley, W2ICE, Main St., RD #3, Holcomb, NY 14469.[BK]

Literature (Continued from p. 16)

Vol.	Sets Introduced
1	1946-January 1947
2	January 1947-July 1947
3	July 1947-January 1948
4	January 1948-July 1948
5	July 1948-December 1948
6	December 1948-May 1949
7	May 1949-October 1949
8	October 1949-Dec. 1949
9	December 1949-March 1950
10	May 1950-July 1950
11	July 1950-October 1950
12	October 1950-Jan. 1951
13	January 1951-April 1951
14	April 1951-August 1951
15	August 1951-Nov. 1951
16	October 1951-Feb. 1952
17	January 1952-May 1952
18	April 1952-August 1952
19	July 1952-December 1952

11-20, etc. The volume concept was dropped in favor of individual folders in the early 1950s. The numbering of folders has reached about 2600 today. -OTB-

COVER PHOTO: GENERAL ELECTRIC 'OCTAGON' TV RECEIVER

This GE televisor, ca. 1928, was used for demonstration telecasts from W2XB in Schenectady. It was a modified Radiola 51, tuned to 7900 kHz, with scanning disc added. See the Television Receiver column for more details. Photo: Bruce Polin.

NEW MEMBERS (Continued from p. 35)

Steve **Oster**, CA
Derick W. **Ovenall**, N3EGR, DE
Don **Packard**, OK
Edward C. **Paradis** III, GA
Joseph M. **Pawell**, ex-WB2FJS, NY
Richard A. **Penmall**, NY, GE & Wurlitzer
Scott M. **Phillips**, Sr., NY
Claude **Poletti**, MC
Stefan **Ponek**, CA
Anthony C. **Portadino**, FL, antique radio-TV service shop
Michael **Radow**, WA2NHF, NY
Martin **Reichert**, ON
Michael W. **Riggle**, UT
Dan J. **Rothernel**, MD
Jack W. **Rowe**, KD6SU, CA
Anthony S. **Rura**, W2UDA, USNR, Western Electric, etc.
Michael B. **Schiffer**, AZ
Ronald J. **Schuller**, OH
Howard **Sedgewick**, KS, repair of Books for the Blind tape decks
Gianfranco **Sinigaglia**, I4BBE, Italy, Prof. of Applied Electr.
A. D. **Sinning**, W0UYS, MN
Donald E. **Skabelund**, NM
Wm. L. **Skidmore**, ON
Charles R. **Smith**, CT, former Chief Engineer, WSPR, WFTN
Charles Lester **Snarich**, IL, TV repair
Dr. Edward L. **Snyder**, CT
Ronald **Sohn**, IL
Neil **Spencer**, W4PC, FL, radio-TV engr, ship op., lic. 66 yr. (!)
Richard R. **Spratley**, VA
Mark **Springer**, NY
Jack **Stafford**, NE, Jack's Fine Furniture Finishing
Jon **Stanton**, CA, KA6BMC, Family Radio Inc.
Gerald **Steffens**, MN
Allen "Wayne" **Steiner**, KS
Larry J. **Stemple**, KC8XRU, WV
William **Thompson**, W2MTA, NY
Terry Lee **Tomaras**, MC
Tony **Trinko**, CO
Walter **Troyer**, TX
Dr. Berford A. **Turke**, FL, Audio Intelligence Devices
Joseph M. **Turner**, K8CQF, MI
Satoru **Uchio**, Japan
Allan **Uttrecht**, LA
Rosario P. **Vaccaro**, KD2YC, AIL-Eaton
Nicholas **Viania**, NY
Franklin D. **Vrana**, MO
Thomas J. **Wagner**, CT
R. Lyman **Walker**, CA, electr. distributor, Navy elec. tech.
Ken **Watkins**, KY
Mike **Wendel**, IL
Fred R. **Williams**, KWI 6109, CT
John **Williams**, MT
John M. **Williams**, MC
Barry **Wiseman**, N6CSW, CO
Chuck **Wolski**, N2IKW, NY
Dr. Alan **York**, NY, K2TMJ
Dan **Zeh**, CA

[Joyce Peckham, AWA Secretary]

WRGB (Continued from p. 13)

Democratic nomination for the U. S. presidency at the state Capitol in Albany.

WRGB began regular network operation of a sort in 1939, rebroadcasting WNBC from New York City by off-the-air pickup. This gave live coverage of the visit of the king and queen of England to the New York World's Fair that year. The transmission path was about 140 miles long, with the receiver site about 7000 feet (!) below line of sight. The station put up a 400-foot rhombic antenna on four 125-foot towers and built a 160-MHz relay link to reach a short additional distance to the WRGB transmitter site.

A far better technical approach became possible in 1947, when GE built a 2000-MHz microwave system to import the signal direct-ly to Schenectady. By using three repeater stations on mountaintops, it was possible to bring in a much more reliable signal. The system used Sperry SRL-7 klystrons at a few watts' output. Microwave transmission over long distances is almost old-fashioned in today's "fiber" world, but in 1947 it was pioneering stuff.

(Thanks to Fred Chesson for source material. The microwave link is described in the May, 1949 "Proceedings of the IRE.")[LAS]

Australia (Continued from p. 9)

remarkable number of home-grown manufacturers as well as local production by American, British, and European radio firms. Nowadays, of course, most of their radios, TVs, stereos, etc. are Japanese, though some of the old names live on affixed to Asian-made products. Interestingly, one of the largest names in Australia over the years was AWA. That stands for Amalgamated Wireless Australasia Ltd., but those initials are dear to all of us.

Everybody who reads the OTB knows that antique radio enthusiasts tend to be good people, and any American who has been to Australia will tell you that the Aussies are among the friendliest, most easy-going, and most hospitable people in the world. Just put the two together and try to imagine what Australian radio nuts are like. I have never felt so welcomed by a group of total strangers in my life. It is hard to describe the warmth we felt. All I can do is to urge other AWA members to go Down Under and experience it for themselves! Just make sure you allow more than two weeks.

-OTB-

Museum News

INTERNATIONAL MUSEUM OF PHOTOGRAPHY

The new wing of the International Museum of Photography in Rochester is now open to the public. AWA is contributing to its television exhibit by loaning several early television artifacts, including E. F. W. Alexanderson's original Nipkow disc.

Contrasted with the Museum of the Moving Image described in the February OTB (p. 11), this museum houses one of the world's largest collections of still photo artifacts. Here are some figures. Still Photography includes 500,000 fine-art prints and more than 100,000 negatives. The work of over 8000 photographers is represented, from Daguerre to the present. Technology includes more than 10,000 pieces of equipment, including still and motion-picture cameras, viewers, and accessories. Film includes of 7,000 motion-picture films and three million publicity and production stills. The library houses 28,000 volumes of books and periodicals on film and photography.

The Museum is located at 900 East Avenue, Rochester, NY. For additional information, call 716-271-3361.

MAARC

The possession of historical equipment serves little purpose if it is not shown to others who can admire and relate to the past. Another public radio museum is in the making and should be open sometime this year. Members of the Mid-Atlantic Antique Radio Club (MAARC) deserve your support (dues $12.00/year): MAARC, Nevell Greenough, 62 Nancy Drive, Hamilton Square, NJ 08619. [BK]

DEARBORN REVISITED

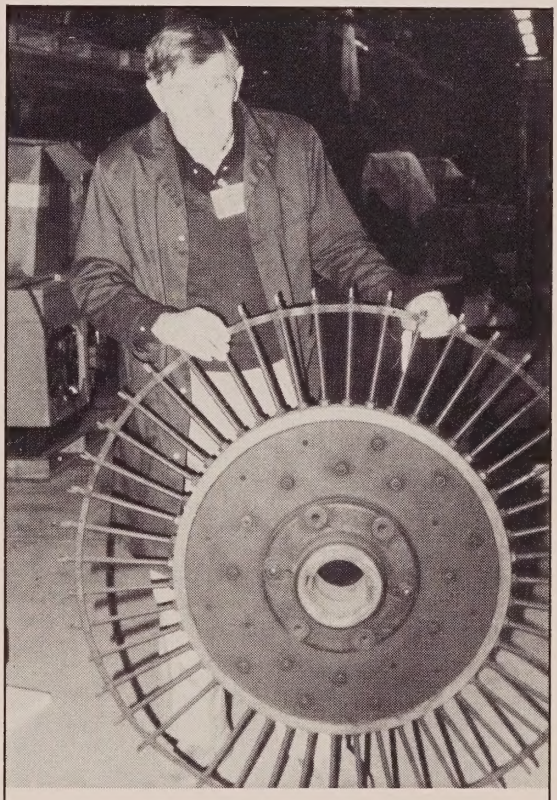
I've always been a fan of the famous Ford Museum at Dearborn, Michigan, and so was pleased to go back after a long absence. I had been asked to assist in identifying certain radio artifacts. After several days examining their collection, I believe theirs may well be the most comprehensive in this country.

The assemblage, most of which is in storage, is made up primarily of three renowned collections: those of RCA/George Clark, McMurdo Silver, and John Hayes Hammond.

Several concerned historians had asked me to determine if certain rare pieces are still in the Museum's possession. I am happy to report they are. One is the famous rotary gap used at the historic Arlington Naval Station NAA. It is in a large warehouse along with the 1910 Hulit fully automatic key - one of three known to exist.

Telegraph historians wanted to know if Edison's Quadraplex setup is still on display. It is, along with a fine exhibit of early landline instruments. A full report with photographs will appear in a future Bulletin.

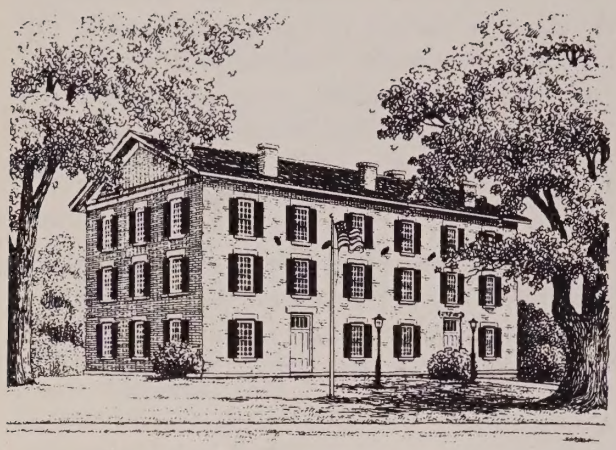
The Museum and nearby Greenfield Village demand at least a two-day visit. Try to include it in your vacation this summer. Hours and other information may be obtained by writing Henry Ford Museum, Dearborn, Michigan 48121, 313-271-1976.



I located this rotary gap, designed and built in 1912 by Reginald Fessenden for the 50-kW NAA spark transmitter.-

-OTB-

THE MUSEUM



MUSEUM OPEN FOR SEASON; GUIDES NEEDED

Every year we lose two or three guides due to age, illness, or moving from the area. The need for new personnel is constant. Without them the Museum would close. If you would enjoy being on the Museum Guide Staff, please contact me: Art Kelly, Box 85, Holcomb, NY 14469, or call 716-657-6991. [AR]

MUSEUM MAINTENANCE FUND

The Museum Committee wishes to thank members who have contributed to the Museum Maintenance Fund. Like all museums, AWA has continuous expenses requiring contributions and fund-raising activities. The Association has never had the need to borrow or apply for a grant. Here are some of our major operational expenses: liability insurance on a public building; fire and theft insurance on artifacts; utilities (electricity and telephone); security system; advertising, brochures, affiliations; rent, general maintenance, construction.

We've been fortunate in receiving generous contributions and, most important, excellent volunteer labor. Thank you! [BK]

WAREHOUSE (ANNEX) OPEN

The Museum Annex will open the second Wednesday of each month between May 10 and September 13 at 7:30 PM. Visitors must go to the Museum to gain admittance. The opening will provide an opportunity to see equipment not otherwise on display, check progress on the new office facility, and to purchase surplus items offered for sale. [BK]

AWA ELECTRONIC COMMUNICATION MUSEUM

Location:
Village Green, Rtes. 5 & 20
East Bloomfield, New York

Hours:
May 1st through October 31st:
SUNDAY, 2 to 5 PM
June 1st through August 31st:
SATURDAY, 2 to 4 PM
WEDNESDAY, 7 to 9 PM
(Closed Holidays)

Group tours by appointment: 716-657-7489
Museum telephone: 716-657-6260

FREE ADMISSION

Curator:
Bruce Kelley, W2ICE
Assistant Curator:
Steve Sykes, KD2OM
Administrative Staff:
Charles Bliley, K3NAU
Dick Fish, W2OWF
Art Kelly, W2ROB
Don Ray, WA2PKS
Roland St. Louis, K2LKH
Morgan Wesson
Treasurer:
Dex Deeley
Legal Counsel:
Sherwood Snyder, W2KFU

NEW GEAR

Thanks to L. P. Albert, VK2BPR; Mark Dillenbeck, WA2IVF; Charles Gleason, W2RBT; Fred Linn, W9NZF; Walt Malone, W2PZH; Bob Ryan; and Robert Sinclair, W2PYW (SK). [BK]

-OTB-